

LONGITUDINAL SECTION THROUGH HUMAN HAIR-FOLLICLE.
(AFTER FIGURE IN BRASS'S ATLAS OF HUMAN HISTOLOGY.)

I.S., Inner root-sheath; O.S., Outer root-sheath; G.L., Glassy layer; H.L., Huxley's layer; H'.L., Henle's layer; P., Papilla; V., Vessels.

THE HAIR AND ITS DISEASES

INCLUDING
RINGWORM, GREYNESS, AND BALDNESS

An Introductory Handbook

BY

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Golden Rules of Skin Practice. 1s. net. *Third edition.* Wright and Co., Bristol.

Age and Old Age : a handbook. 2s. 6d. Everett and Co., London.

PREFACE TO FIRST EDITION

THE well-being of the hair is a thing that appeals sooner or later to almost all men and women. In our present state of knowledge, however, much remains to be learned concerning the maladies that affect the human hair. For all that, great strides have been made of late years in this as in other fields of medical research, thanks chiefly to the study of bacteriology. Indeed, that handmaid of science may be said to have revolutionized our views as to the care of the hair both in health and in disease. As scientific knowledge widens, it may be hoped that the treatment of this important class of maladies may become part and parcel of the daily work of the medical practitioner, to whom this little introductory handbook is most cordially dedicated.

D. W.

LONDON, W., *April*, 1902.

PREFACE TO SECOND EDITION

THIS little work has been out of print for some years, and its second edition has been improved in various ways. The study with which it deals is coming more and more within the range of medical knowledge. Nevertheless, many educated persons still believe the assertions of quacks, who foist all kinds of extravagant nonsense upon the public with regard to the hair. Its chief matter of fresh interest is the development of electrical methods of scalp stimulation. These methods, it should be noted, are of such a kind as to be in the highest degree dangerous in the hands of persons untrained by careful medical education to recognize the accompanying physiological effects.

A short note has been added to the present edition on diseases of the nails and their treatment.

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LONDON, W., *October, 1907.*

THE HAIR AND ITS DISEASES

PART I

INTRODUCTORY AND GENERAL

THE study of the human hair opens up a field full of interesting problems, of which it may be at once confessed that many are as yet ill-understood. Of late years, however, a host of scientific observers have been at work, and a rich harvest of facts has been garnered. Happily, signs are not wanting that before long this subject will be brought well within the grasp of medical science. The matter is of importance, for it appeals strongly to the vast majority of men and women, in whom Nature has implanted an unfailing instinct in favour of personal comeliness. In this little book the writer has endeavoured to present a concise and trustworthy account of modern knowledge in this special branch of medical work.

The literature on hair is enormous, dating, as it does, from the earliest known records of mankind. The sculptures of Assyria and of Egypt show that great care was bestowed on the ceremonial dressing of the hair and beard. Many customs connected with the cropping or shaving of the scalp or beard have been noted in the

history of Greece, Rome, Babylon, Phœnicia, Judæa, and other famous centres of civilization in early times. Wigs were certainly known to the ancient Egyptians and Greeks.

The razor is first mentioned in the Bible in the Book of Numbers (vi. 5), written some three or four thousand years ago. In all ages—early, medieval, and modern—the hair has been the subject of sumptuary laws.

The craft of the barbers became raised above that of a mere trade in the twelfth century, when they undertook operations that were forbidden to the priests by Papal decree. In the fourteenth century they had attained the dignity of a distinct guild, the members of which performed bleeding and minor operations, and in some countries, at any rate, visited the sick. From this humble beginning the medical practitioner of modern times has gradually arisen. As most people know, the barber's pole and notched brass basin are relics of the days when bleeding was in fashion. The stripes on the pole represent the bandages, the red colour refers to the blood from the arteries, and the blue to that from the veins. The notch in the rim of the basin was to accommodate the arm of the patient from whose veins the blood was drawn.

The hair on the human body is of various kinds: it includes the long hair of the scalp, the downy hair of the general surface of the skin, the long, stiff hairs of the eyebrows, eyelashes, beard and moustache, armpits and genital regions, as well as that of the ears and nostrils. There can be little reasonable doubt that all these various growths are relics, as it were, of the general hairy covering that is common to the higher Mammalia. Variations of special parts of the hairy appendages may be well seen not only in the higher apes and monkeys, but also

in the Carnivora and other furred species, as the horse, mule, dog, cat, and squirrel. A good idea of the specialization of hair in texture and in distribution may be gained by the careful study of a chimpanzee, a male lion, a donkey, a hog, and a squirrel. The special characters of human hair are now so strongly marked, however, as to separate widely the *genus homo* from the rest of the mammals. There are many points in this distribution that in our present state of knowledge it is impossible to explain. At the same time we may safely assume that sexual selection and fitness of organs to special environment have been closely connected with the evolutionary changes.

The Darwinian theory, then, would lead us to picture primeval man roaming the woods clothed in thick hairy fur that protected his body and kept him warm. That possibility or probability is borne out by the following facts:

- (1) The hairy covering of the infant, or lanugo.
- (2) The occurrence now and then of hairy men (reversion or atavism).
- (3) The existence of a hairy race in Japan.
- (4) Feminine reversion to a primitive bearded type.
- (5) The ordinary downy hairs of the skin surface throughout life.

1. **The Hairy Covering of the Infant, or Lanugo.**
—The fascinating theory, recapitulation, first advanced by Müller, tells us that each animal bears the mark of its ancestry in the different phases of its development. Thus the human embryo begins as a simple cell, exactly resembling the simplest known form of life. At birth the infant is covered with a growth of hair which is shortly afterwards shed. According to the evolutionists that covering points to a remote hairy ancestor in the race pedigree. In the course of ages the furry covering

has become degenerate, as it was no longer needed by the animal. Sometimes the degeneration, for some reason or other, does not take place, and then we have the next phenomenon.

2. **The Occurrence of Hairy Men** is a condition due either to persistence of the infantile lanugo or to overgrowth of the usually downy body-hair after shedding of the lanugo. Many authentic instances have been recorded of hairy men with bodies and limbs more or less covered with hair of various lengths up to 4 or 6 inches or more. Well-known instances are the Burmese Sheve-Maon and his family through three generations. His hair was silvery grey, straight and silky, and grew upon face, nose, and ears to a length of 8 inches, while that of his shoulders reached 4 or 5 inches. At birth the ears only were involved, while it appeared upon his forehead at six years of age, and gradually over his whole body. His teeth were deficient, as commonly happens in these cases; as shown by a portrait, his face has a general resemblance to that of a Skye terrier. Other well-known instances are the Russian Andrian Jewtichjew and his son, and the Spanish dancer, Julia Pastiana.

3. **The Existence at the Present Day of a Hairy Race in Japan**, commonly called the 'hairy Hainus' or 'Ainos.' They are a small tribe of islanders with primitive brain development, whose bodies are covered with long hair.

4. **Feminine Reversion to a Bearded Type.**—The occurrence of a more or less well-developed beard and moustache in women is not infrequent. It may either persist from birth or develop in later life. There are many well-authenticated instances of women having a luxuriant crop of hair upon the upper lip and chin.

It seems likely that originally both men and women had hairy faces, but in the case of man it was retained as a sexual attraction, and also because it made him look bigger and more formidable to his foes.

5. **The Ordinary Downy** hair of the skin surface is probably the atrophied survival of a thick vigorous covering.

The foregoing considerations are suggestive of an ancestral fur. Evolution, at any rate, offers us the only key to many otherwise perplexing facts.

The direction of the hair is another obscure point which may perhaps also be explained by *atavism*, or reversion to ancestral type. The most familiar example of methodical arrangement is the whorl of hairs at the top of the head, known as the 'crown.' Now and then there are two crowns on the same head. On the body the hair sometimes lies contrary to its usual direction.

The mammalian hair originally provides a non-conducting covering, which keeps the body warm and protects it from sun and rain. It also excludes insects in some positions (nostrils and ears), and is a general organ of touch. The last faculty is specially developed in some positions, as in the vibrissæ, or long sensitive hairs on the eyebrows and upper lips of the carnivora. By means of these sensitive 'feelers' a cat is enabled to steer a way in the dark amid trees and other obstacles. In this connexion may be mentioned the extreme sensibility of the coarse hairs that develop in the eyebrows of man after puberty. The tactile function of hair has probably not been recognized to its full extent.

Next to the skin, the hair is one of the things most essential to the personal attractiveness of the individual. That being so, it is curious that the study of diseases of the hair has not yet attained any high position as an

exact and systematic branch of medical science. Unfortunately, this lack of proper guidance has permitted the treatment of many curable maladies of the hair to drift into the hands of persons whose sole qualification for the task consists in a prescription or two picked up from the pages of a medical work or from lay journals. As a matter of fact, the intelligent treatment of diseases of the hair demands a competent knowledge of bacteriology, of modern drugs, and of general medicine. With hair, as with skin, the best all-round physician is the best man to consult; in the majority of cases it is useless to treat the hair without a careful investigation of the general health of the patient. Almost all recent advances have been due to the recognition of the part played by micro-organisms in disease. From the point of view of the bacteriologist, baldness, for instance, is due to microbes, and is therefore preventible. Moreover, if the commonest cause of baldness—that is to say, seborrhœa—be due to these bacteria, then it follows that seborrhœa is an infectious malady, and can be conveyed by infected brushes, combs, and other articles. The far-reaching importance of that fact can readily be imagined.

The popular ignorance upon the subject of the hair is ludicrous and overwhelming. The belief is common, for instance, that the hair is a tube, and that singeing is good, 'because it seals up the ends of the tubes.' As will be shown later, the hair-shaft is made up of closely packed cells. Another vulgar error is that hair grows after death. As a matter of fact, it is a marvellously lasting structure, as testified by the fact that it is found in graves long after every other trace of the body has vanished. In ancient Egyptian mummies hair is found that must have belonged to men and women who lived three or four thousand years or more ago. One of the most wide-

spread fallacies with regard to the hair is that it can be nourished by rubbing pomades and other greasy preparations into the skin. Like all other tissues of the body, including teeth and bone, hair derives its nourishment from the blood—for all that it would be difficult to convince many presumably educated persons that the hair cannot be nourished by means of external applications; indeed, no fable with regard to the hair seems too monstrous to be swallowed by the people. One more may be mentioned by way of climax—to wit, the belief held by many worthy folk that the growth of the beard and moustache deprives the scalp of nourishment, and thereby leads to baldness. This absurdity may be compared with the popular trust in ear-rings as a remedy for eye troubles. The circulars and advertisements of quacks are stuffed with nonsense of this kind regarding the hair. Some of their claims, too, are so obviously fraudulent that it is a wonder the authorities permit them to be published.

In the present stage of scientific inquiry it is unfortunately true that not a few gaps exist in our knowledge of the diseases of the hair and their treatment. Nevertheless, it is equally true, on the other hand, that medical skill and experience can in many instances bring relief or cure. A great part of the battle is to have a case under observation in the early stages—a remark that applies to many other conditions brought under the notice of the medical practitioner. One of the most interesting and practical results of modern research has been to establish the close connexion between not a few eruptions of the skin—as acne, acne rosacea, and some forms of eczema and so-called psoriasis—with certain diseases of the hair and scalp. Some distinguished observers, especially on the Continent, do not hesitate to ascribe this association

as one of cause and effect—in other words, the micro-organisms that cause the trouble in the scalp infect the face and the general skin surface.

Before entering upon the detailed description of diseases, it will be desirable to master the following brief sketch of the anatomy and physiology of the normal hair.

ANATOMY AND PHYSIOLOGY OF THE HAIR

The hair is a specially modified portion of the skin covering the external surface of the body. The part of the hair that can be seen is called the *shaft*, while that concealed beneath the surface of the skin is known as the *root*. The latter comprises the *bulb*, or enlargement of the shaft which surrounds the *papilla*, or small bud of connective tissue, containing bloodvessels that penetrate the base of the hair. Around the bulb and papilla are numerous layers of cells or sheaths. The whole of the hair-structure below the skin comprises the *hair-follicle* (see Frontispiece).

The hair-shaft is covered by a thin *cuticle*, made up of minute non-nucleated cells, arranged like sloping tiles. Beneath that covering comes the cortical layer of several rows of long, flattened, nucleated cells, from $4.5\ \mu$ to $11\ \mu$ broad, which are united end to end into straight, rigid fibrils or rods that can be separated by treatment with ammonia. The colour of the fibrous substance is caused by scattered pigment granules, and also by generally diffused colouring matter. Minute air-spaces are usually present, and in white hairs are abundant; but they may be altogether absent in dark hairs. In either case it should be noted that the question of colour or no colour depends on the condition of the cortex.

The cortical or fibrous substance constitutes the whole shaft in the fine down or lanugo, that covers the surface of the body of the adult, and very commonly also of the head in children under five years of age. Otherwise it encloses a central *pith*, or *medulla*, composed of several

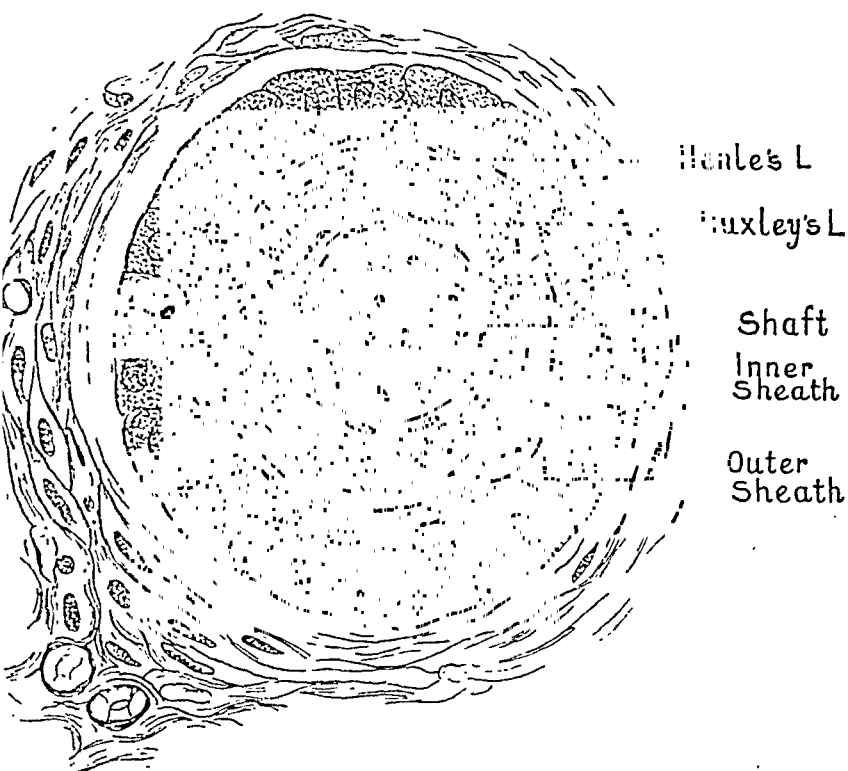


FIG. I.—TRANSVERSE SECTION OF HAIR-FOLLICLE. (AFTER BRASS.)

rows of polygonal, nucleated, and non-pigmented cells. When viewed by transmitted light the medulla is black; but it is white when seen by reflected light. The latter fact has doubtless given rise to the popular fallacy that the hair is a tube. The cells of the medulla contain

keratohyalin, but those of the cortex are completely keratinized or cornified.

The *root-sheaths* are rings of cells enclosing the hair and bulb. The inner root-sheath is composed of three layers, named from within outwards, the *inner cuticle* (next to the cuticle of the hair); the *layer of Huxley*, of two strata of flattened, polygonal, nucleated, and pigmented cells, and outside that the *layer of Henle*, composed of clear, non-nucleated cells. The outward root-sheath corresponds with the Malpighian or prickle-cell layer of the skin. It is composed externally of loose fibrous tissue, enclosing a layer of bundles, and of an innermost basement of hyaline or 'glassy' membrane.

These points may be followed out with the help of the accompanying diagrammatic illustration (Fig. 1).

The follicle receives the duct of the sebaceous glands, which open somewhere near the surface (see Frontispiece).

The nerves of the hair are to be found in the papilla and in the hair-follicles. A single nerve usually encircles the hair-follicles a short distance above the mouths of the sebaceous glands. The nerve-fibres lose their medullary sheath, and are distributed mainly about the outer (glassy) root-sheath. The nerves are more strongly marked in the tactile hairs of certain mammalia, and have been described by Schöbl as forming a close plexus with vertical meshes round the upper end of the follicle. Tactile discs have been demonstrated as nerve-endings in the outer root-sheath of some mammalian hairs.

The small bundles of smooth muscle-fibres connected with the hair-follicles are known as the *arrectores pilorum*. Their action is to raise or erect the hairs, as in the well-known 'goose skin,' or *cutis anserina*. In their course these little muscles often encircle the sebaceous glands.

Development of Hair in the Fœtus.—About the third month of intra-uterine life small ingrowths bud downwards from the Malpighian layer of the skin. A papilla is formed at the base of the undergrowth, and from these structures are ultimately developed the hair

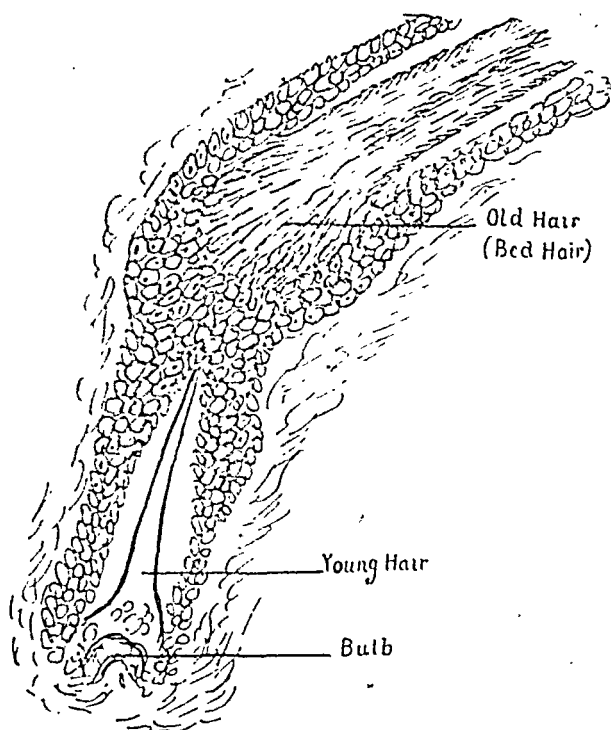


FIG. 2.—REPLACEMENT OF AN OLD HAIR BY A YOUNG ONE IN HUMAN SCALP. (AFTER RANVIER.)

and its follicle. The process may be studied from the accompanying figure by Ranvier (Fig. 2). The first crop of hairs, called the *lanugo*, appears about the fifth month, and some or all of it is shed before birth. According to Kölliker (Quain), the infantile hairs are entirely shed

and renewed within a few months after birth—those of the general surface first, and afterwards of the eyelids and scalp.

The Shedding of Hair is common to man as to the rest of the Mammalia. In man it is continuous—that is to say, the adult hair is shed and new hairs formed during the whole of his lifetime. The hair that is to be shed becomes detached from its bulb, and is gradually pushed out by the development of a new hair-bulb and hair. For some time the old hair is attached to the follicle, while the new one is called the papillary hair.

Hair is found on all parts of the body, except the palms and soles, the backs of the terminal bones of fingers and toes, and the lips. It is present on the upper lids, but is so short in that position as not to project beyond the surface. The average life of a scalp hair is estimated at from two to four years (*vide* Brunn), and that of the eyelashes from three to five months.

The rate of growth of the human hair is about half an inch per month on the scalp, and a greater in summer than in winter.

The direction of the follicle is usually slanting, except in the eyelashes, which are usually planted perpendicularly to the surface. Curiously enough, in the negro the hair-follicle is often curved. All who have had much experience in the removal of superfluous hairs by electrolysis know that the direction of the follicles, especially about the chin, varies so greatly that the insertion of the needle can be guided by no exact rule.

The sebaceous glands are developed from the sides of the down-growing hair-follicles. They are small, saccular glands found alongside the hairs, and they

discharge a fatty secretion by a duct opening near the middle of the hair-follicle. Their size is often in inverse ratio to the size of the hair. Thus, the fine, downy hairs of the cheeks are often associated with large sebaceous glands. The accumulation of the sebum gives rise to comedones or 'blackheads,' and the over-activity of

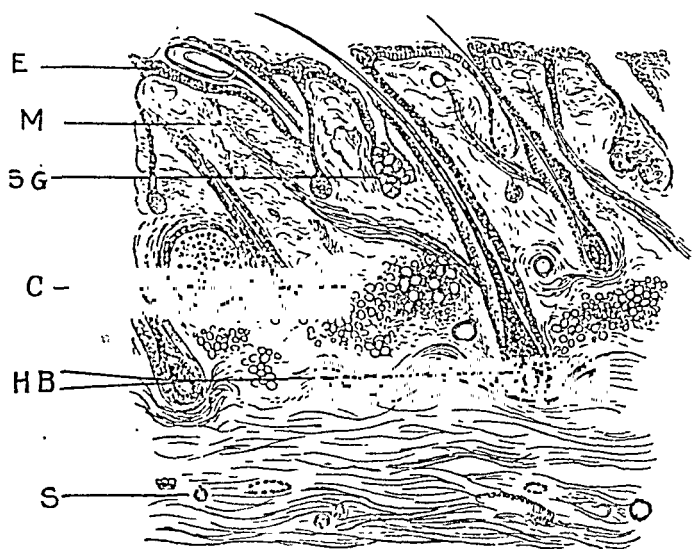


FIG. 3.—SECTION OF SKIN.

E, Epidermis; M, Arrector muscle of hair; SG, Sebaceous gland; C, Corium; HB, Hair-bulb; S, Subcutaneous tissue, with bloodvessels, nerves, etc.

these glands results in the greasiness of hair sometimes found in chronic inflammatory conditions of the scalp. It is often accompanied by acne, red nose, and greasiness of the skin.*

* For a more detailed account consult Quain's 'Anatomy' (vol. i., part ii.) and Huber's translation of Bohm and Davidoff's 'Histology' (Saunders).

THE HYGIENE OF THE HAIR

The care of the hair forms a more important item of our daily lives than most people realize. In man the hair is cut short, parted, and kept smooth in the simplest way possible. In woman, on the other hand, a more elaborate toilet is adopted, and the hair is worn long and dressed in all sorts of ways, according to the fashion for the time being. Baldness is far more common in men than in women. The reason is possibly connected with the more frequent visits of men to barbers' shops, and the use of strange brushes at clubs and other places, by both of which means their scalps become infected. This point will be referred to later.

The state of the hair is closely related to the general health. In its normal state hair has a glossy, silky look, that differs entirely from the dull, dry appearance of hair that is out of condition. In one case known to the writer, the hair of a blonde lady turned several degrees lighter with each one of a series of attacks of influenza. This sympathy of the hair with the rest of the body is met with in the racehorse, for a change of drinking-water will often show itself at once in the coat of the animal. The hair, it should be borne in mind, depends for its nourishment on the blood, any serious alteration in which is sure, sooner or later, to tell upon the hair. Increasing experience has convinced the author that the hair is a delicate index to the general health. It is in many cases useless to attempt to treat the hair without attending to the digestion or to some other trouble. A lady once came to consult the writer for falling hair. Both her knees were full of fluid and exquisitely tender from a rheumatic affection, and she was in a dangerous con-

dition from heart-failure. This is only one of many instances that might be given.

Origin of Seborrhœa in Acute Illnesses.—As a rule, a patient suffering from falling of hair or baldness consults the physician when the process is too far advanced to admit any reasonable chance of cure. The diseased condition may be arrested at any stage of the process with skilful treatment; but that is a different thing from bringing back a good growth of hair. In this, as in many other disorders, everything depends on early treatment. The scalp should be attended to from childhood upwards. Not a few bald heads date from the cradle, and many others from some acute malady, as typhoid or scarlet fever. It is therefore advisable to seek the best medical opinion available should the hair remain thin or the scalp inflamed or scurfy for any length of time after a severe illness. The specialist who has had much experience of diseases of the hair knows how often their origin can be traced to that cause. The present writer has found it to be the case especially after measles and scarlatina. From a large experience both in hospital and private practice he can testify that rheumatism or a rheumatic tendency is to be noted in a great majority of sufferers from seborrhœa and its associated troubles of the hair—namely, thinness, greyness and baldness. There is no doubt that anæmia, indigestion, chronic constipation, and other disorders sometimes play an important part in symptomatic diseases of the hair.

The main causes of baldness and other morbid conditions of the hair, however, are local—that is to say, they are due to causes that attack the hair from outside the body. In this way the fungus of ringworm is conveyed by means of germs or spores to the scalp, where it destroys the hairs over a greater or smaller surface.

The patchy baldness known as alopecia areata is in its infectious forms almost certainly conveyed in some such manner. Ordinary baldness, however, is a symptom often due to infinitely small organisms—bacteria, possibly of more than one kind. The main part of the baldness of man, according to the view of some distinguished authorities, is caused by the micro-organisms of seborrhœa. Greyness is a sign of atrophic change, and when dependent on seborrhœa, as often happens, may be both preventable and curable.

The exposed position of the head makes the hair of the head a kind of trap for air-borne dust and micro-organisms. When the latter reach the scalp, they find warmth, moisture, and other conditions necessary for their growth. Were it not for daily brushing, the head would soon become unkempt and full of dust. Washing is also required from time to time, and there can be no doubt whatever that the average man or woman is apt to be negligent on this point. The head should be washed every fortnight or oftener. Any good plain soap can be used, and the suds rinsed out thoroughly with warm water. The choice of a good soap is of importance. An excellent special 'Detergent Hair Soap' for the scalp—especially when greasy or affected with dandruff—is made by E. Schmolle, of London. It contains salicylic acid and other antiseptics in combination with a superfatted soap basis, and is adapted equally well either for cleansing the adult scalp or for use in the nursery. If there be much dandruff or oiliness, the head may be shampooed with spirits of green soap, or in severe cases with ordinary yellow soft-soap. The latter,

* This soap and a special hair-brush disinfectant can be obtained from Savory and Moore, New Bond Street, London, W., and from other chemists.

however, should not be used more than once a week, nor should it be continued for a longer period than a month or six weeks, except under medical directions. The hair will dry more quickly if washed in hot water and rubbed with a warm towel. The washing can be conveniently carried out at a Turkish bath, and a good douche at the end of the process will cleanse the scalp in a most satisfactory way. In this case the head should not be dressed by any strange brush or comb at the baths; it can be smoothed down with the hands, so as to pass muster until the bather returns home.

A few words may be said as to pomades and other greasy and oily applications for the hair. The better-class Englishman has long ago settled the matter in his common-sense way by leaving everything of the kind severely alone. A well-bred man nowadays would as soon think of ranging the streets without a tie as of scenting his handkerchief and oiling and perfuming his hair. It is true that when his hair becomes thin he falls a prey to the vendors of all kinds of worthless hair-restorers, but after a fair trial he bows to the inevitable, and abandoning all quack preparations, he as often as not returns to the hard brush that he used when his hair was thick.

The four main things complained of by the average man or woman affected by seborrhœa are dryness of the hair, dandruff, greyness, and falling of hair (including baldness). Now, all these things, if excessive and not due to sheer weight of years, are symptoms of a diseased process. To treat them with oils, spirits, dye-stuffs, and haphazard stimulation, is, in ninety-nine cases out of a hundred, to leave the origin of the trouble untouched. As a matter of fact, the majority of the preparations sold for the benefit of the hair are worthless, while some

of them are actually poisonous and otherwise harmful. Take the falling of hair, which is a symptom of trouble almost always due to bacteria or some of their toxic products. Nature is doing the right thing in getting rid of the damaged and bacteria-laden hairs, and the soundest medical treatment would be in most instances based on a similar line of action; yet a host of costly preparations are advertised under fancy names to stop the falling of hair. It may safely be said that no remedies known to scientific medicine will effect that purpose, although one sharp vendor has reaped a fortune by the sale of an inert drug warranted to do that and to make hair grow. The rational method seeks to render the scalp as far as possible free of micro-organisms; in other words, it aims at the origin of the mischief. Many of the shop pomades and washes are themselves simply swarming with various bacteria, and for that reason alone it would be well to refrain from using them. The old-fashioned idea that nourishment can be conveyed to the roots of the hair by rubbing in fatty substances is too absurd on the face of it to need discussion.

The key to the care of the hair in health and to its treatment in disease lies in the modern discoveries of bacteriology. Although it cannot be said that we have probed the subject fully, yet, on the other hand, we know enough to be able to say confidently that baldness, apart from sheer old-age wasting, is due in the great majority of cases to seborrhœic processes, and those in turn to the invasion of the hair-follicles by one or more species of organisms. That being the case, infectiveness at once springs to the front in the study of baldness. The organisms of the seborrhœic scalp may be conveyed from an infected to a healthy person, just as the organisms of small-pox or of erysipelas might be trans-

mitted; in other words, ordinary baldness is the result of infection. The brush and comb must therefore be regarded in the light of common agents in the distribution of the infectious organisms of the scalp. Not only does the brush of a sufferer from seborrhœa become a danger if used by anyone else, but it is just as likely to reinfect his own scalp. This principle, if once grasped, can be readily applied to a number of cases. For instance, every brush and comb should be regularly disinfected, not merely washed, but rendered free from organisms by the use of antiseptics. No strange brush should ever be used—say at a club, hotel, or the house of a friend. Then we come to what is in some ways the most important question of all—inasmuch as in all probability it has been a main distributing agency of seborrhœa through all the ages of civilization—namely, the brush and comb of the hairdresser. This part of the subject will be dealt with in a special section (see p. 22).

Comb and Brush.—It will naturally be asked: 'What is to be done, then, to keep one's hair tidy?' The answer is not easy. It would be possible, however, for every one to carry about a small pocket-comb, say 2½ or 3 inches long, and use it when required. The comb should be of metal or of some material that will stand being now and then sterilized by plunging in boiling water. It should be kept in a case that can be disinfected in the same way. The case, therefore, should be of metal or of some soft material, such as linen, which can also be sterilized now and then in boiling water. Armed with this, it would be possible for almost any man, woman, or child to smooth the hair when away from home. A little untidiness would be preferable to the risk of contracting seborrhœa from alien combs and brushes.

The infected brush has to answer for a great deal in

the spread of seborrhœa. One striking fact about that condition and its results is the way it runs in families, sometimes for generations. It is not that there is any hereditary transmission of scurfiness, greyness, and baldness; but there is a common infected environment, and the chief factor in that is, in the present writer's belief, the hair-brush. Care should be taken that children are never, under any circumstances, allowed to use any but their own carefully kept and systematically cleansed comb and brush. In many middle-class households a single hair-brush does duty for several children, and is often the one neglected object in an otherwise scrupulously clean nursery. One of the author's early recollections is that of a nurse who often used the baby's brush to smooth her own hair. Brushes are not absolutely necessary for children any more than they are for their elders on all occasions. If a child's hair be kept reasonably short there will be little or no need for the use of a brush, which may be quite readily banished from the nursery. The comb should be plunged daily into boiling water, and one should be provided for each child. The hair-brush should be disinfected once or twice a week in the way described in the next paragraph. If nurses are obviously affected with seborrhœa, their heads should be carefully treated.

It should be borne in mind that the comb is just as likely to convey infection as the brush. If, then, the brush or comb of a seborrhœic patient be neglected they become charged with organisms and reinfect the scalp. Under these circumstances such a patient may be keeping up the unhealthy process in his scalp for two-score years or more, until Nature retires from the contest and leaves a bald scalp, which is no longer capable of infection.

The author recommends the following plan of disinfecting the ordinary hair-brush: The brush is first washed with Schmolle's or other good antiseptic soap and water. It may then be placed in an antiseptic solution, bristles downwards, without immersing the back of the brush, for a quarter of an hour or more. When dry, it is disinfected and ready for use. The solution may be made of various well-known antiseptics, such as thymol or weak carbolic acid solution. This should be done once a week, or oftener, where there is dandruff of the scalp or other local troubles. It is not of the least use attempting to cure diseased conditions of the hair if the patient reinfects his scalp every time he uses his hair-brush or comb. When the scalp is healthy the use of a good antiseptic soap once a week or so will suffice, and the solution may be omitted.

Heat, which is the best of all antiseptics, is unfortunately not available with the ordinary bristle-brush. Repeated boiling would soon destroy the bristles, to say nothing of other parts of the brush. Where bristles are used on a large scale, however, as at a hairdresser's, it would not be difficult to devise an apparatus for sterilizing properly constructed combs and brushes by dry heat, much in the same way that a surgeon disinfects all instruments and dressings that are used at operations.

SOME PRACTICAL HINTS AND CONCLUSIONS.

1. Never use a strange brush or comb if you can help it.
2. At the hairdresser's use your own brush and comb, or see that you have these articles clean and aseptic.
3. Have your own brush and comb washed and disinfected regularly.
4. Remember that irritation of the scalp, greasiness, and dandruff are signs of disease.

5. Further, falling hair and baldness, and, in most cases, greyness, are due to seborrhœa or other diseased conditions.

6. No particular preparations can possibly cure all disordered conditions of the scalp; the selection of the right remedy and its use at the right moment is a matter demanding the highest medical skill and experience.

7. In the earlier stages all ordinary diseases of the scalp are curable; in the advanced stages diseased action can, as a rule, be arrested, even though it may not be possible to restore the growth of hair.

8. No scalp can be healthy that is not washed regularly; it is best to use an antiseptic soap for the purpose (p. 16).

One of the greatest advances ever made in hair-brushes is the introduction of the single-bristle brush. This is readily cleansed by the antiseptic soap and dries in a few minutes. The wide spaces between the bristles enables it to be thoroughly cleansed. In the case of the ordinary brush, with its bundles of closely-set bristles, it is well-nigh hopeless to attempt proper cleansing and disinfection, especially the dust that collects inside the bundles of bristles in even the best-kept brushes.

THE HYGIENE OF THE BARBER'S SHOP

The fact that diseases of the skin and hair can be contracted in the shop of the barber has long been recognized. The discoveries of the microscope and of bacteriology have furnished absolute proof of that occurrence. Ringworm was the first disease known to have been thus communicated, but it is tolerably certain that the list may be extended to the following: Alopecia areata (patchy baldness); seborrhœa, with consequent thinning of hair and baldness; various forms of acne, eczema, and

other skin diseases. Instances of anthrax, trichorrexia nodosa, venereal and other diseases have been recorded as conveyed in this way.

A little reflection will show that hair-cutting, hair-dressing, and shaving afford numberless opportunities of conveying infection. The same instruments, and in many cases the same brushes, powder-puffs, napkins, and so on, are used indiscriminately for a series of customers. Then the hands of the barber may convey the infection. In surgery the greatest care is taken to disinfect the hands of the operator and the surface of the body to be operated upon. The instruments are sterilized, and the minutest precautions are taken to prevent contact with unsterilized articles. Such a pitch of perfection is neither necessary nor desirable at the barber's, yet the customer is fairly entitled to demand that he shall run no unnecessary risk owing to the want of reasonable precautions.

Take the case of a parasitic sycosis, or ringworm of the beard, which is in most cases due to an infected razor at the barber's. The complaint is most lingering, painful, and difficult to cure. It may last for months or years, and the affected person may actually have to give up his pursuits and keep out of society. He will be put to great expense for skilled treatment, and his health in the long run may be permanently injured by prolonged worry and suffering. All that misery, which is not overdrawn, has been due to a microscopic germ carried to his chin on a razor or a shaving-brush. If properly disinfected by boiling water, neither of those articles would have conveyed the infection. This wretched disease, then, is preventable, and, so far as the barber's shop is concerned, it may well be asked why it is not prevented.

The main thing to be aimed at by the barber is clean-

liness—that is to say, in the surgical, and not in the ordinary sense of the word. A surgeon's hands may appear fastidiously clean, and yet be charged with dangerous germs that cannot be got rid of without careful disinfection. So, too, with his instruments, for which the best available means of disinfection is heat at or about boiling-point, and that can be readily applied to our knives and other implements by boiling in a suitable vessel. In a precisely similar way the barber can disinfect his hands by antiseptic methods, and disinfect his scissors and razors by boiling. Shaving-brushes can be dipped into boiling water, and should be made so as to withstand that temperature. Powder-puffs are effeminate and useless, and should be done away with altogether. The sponge should be banished from the barber's shop; it may be replaced by a swab of cotton-wool that can be burnt after use. Other points can be gathered from the appended suggestions.

There is no suggestion that the operations of the barber should be carried out with the same minute attention to detail as those of the surgeon. The principles of disinfection are simple enough, and when once grasped can readily be carried out in practice. The craft of the barber is both ancient and honourable, and it may confidently be anticipated that it will, sooner or later, swing into line with modern scientific requirements. The one thing absolutely needed as a first step in that direction is the education of the public from whom the barber draws his custom. For the present the matter can safely be left to the candour and intelligence of the barbers, and there is no need to contemplate the introduction of official supervision such as that exercised in Paris, New York, and Berlin.

SUGGESTIONS AS TO BARBERS' SHOPS.

1. That the hygiene of barbers' and hairdressers' shops should be brought up to date, and, if necessary, their charges increased in proportion.

2. That the barber and his family be free from contagious and infectious disorders. (The barber himself often suffers from *seborrhœa*, and as such becomes a standing centre of infection to his customers.)

3. That persons suffering from diseases of the skin, hair, or beard be excluded from barbers' shops, and attended only at their own homes with their own implements.

4. That, so far as possible, each customer be tended with his own appliances.

5. That all combs and brushes be so made that they can be sterilized after use. That all scissors, razors, and shaving-brushes be sterilized, if possible, by boiling water, or, better still, by dry heat.

6. That all towels, aprons and napkins be clean and newly washed.

7. That the razor be wiped with a piece of paper, and not with a linen cloth.

8. That the use of sponges and powder-puffs be abandoned (a pledget of cotton-wool can be used instead).

9. That the razor-strop be sterilized by dry heat (baking).

10. That the machine-brush be sterilized after each occasion of its use.

11. That the barber's hands be scrupulously clean, his nails clipped, and cleansed with a nail-brush. (The hands should be washed after each customer.)

12. That all oily and greasy applications to the scalp may be charged with bacteria. In health they are needless, and in disease a danger.

THE HYGIENE OF HAIR IN SCHOOLS

The present School Board system, admirable as it is in many respects, has beyond a doubt fostered the growth and spread of various infectious diseases. Judging from the numbers of Board School children that come to the skin hospitals for treatment, the amount of ringworm must be enormous. Now, when we consider that ringworm is a disease that lasts for months or years, and is a serious disability to any child, it seems clear that any proper scheme of public education should take steps to protect scholars from such an infection. In the case of the Poor-Law children of the Metropolis special institutions have been started for children suffering from ringworm, so that the treatment of the disease and the education of the children can be carried out at the same time. An extension of this kind to the whole of the Poor Law children of the United Kingdom is much to be desired. The X-ray treatment of ringworm has been attended by such brilliant results in the special Metropolitan isolation schools for ringworm, that some of them have actually been closed because they are no longer wanted. It is to be hoped that henceforth adequate provision of a similar kind will be made for School Board children under the new medical department recently founded by the Board of Education.

The most frequent way in which the infection of ringworm is spread in schools is by means of brushes and combs and by the playful or accidental interchange of caps.

PART II

DISEASES OF HAIR AND HAIR-FOLLICLES

THE diseases of the hair and the hair-follicles must be considered together, as the hair is affected secondarily by inflammatory conditions of the follicle. Hair is subject to atrophy (congenital and acquired), hypertrophy, developmental defects of colour, shape, and texture, and parasitic affections (animal, fungoid, and bacterial).

A systematic classification of diseases of the hair and the hair-follicles, however, is attended with considerable difficulty in our present state of knowledge. In the present volume the author has adopted a mixed classification as more convenient.

HYPERTROPHIES—EXCESSIVE GROWTH OF HAIR—HIRSUTIES

Hypertrophy of hair may be divided into—

- I. (1) Congenital: *Nævus pilosus*; (2) *Spina bifida occulta*.
- II. Developmental: (3) General; (4) Local.
- III. Acquired: (5) Certain diseased conditions, as *acromegaly*.

I. Congenital Hypertrichosis.

1. *Nævus Pilosus, or Hairy Mole.*—In this condition, at or near birth, there are a few long hairs springing from a deeply pigmented and slightly raised patch, usually rounded and of small size. It is common on the face, neck, and back, but may occur on any part of the body. When disfiguring, the hairs may be destroyed by electrolysis, and the operation can be carried out with speedy and satisfactory results, even in the case of large moles. In various cases the writer has excised hairy moles from the face in female patients with excellent results. Care must be taken to remove the whole of the hair-follicles, which are often deep. When properly performed, this little operation leaves a small linear and barely visible scar.

2. *Spina Bifida Occulta.*—Long hair in the lumbar region is sometimes associated with concealed spina bifida and with other defects, as club-foot and hare-lip.

II. Developmental Hypertrichosis.

3. *General Hirsuties* is met with among the Hairy Ainos of Japan. It is seen now and then in other parts of the world in individuals whose bodies are more or less covered with thick hair. Many famous cases are on record, and in some instances the defect has been handed down for several generations. The study of this subject has led to the curious conclusion that most of the cases of long-haired folk are due to undergrowth rather than an overgrowth; that is to say, the infantile lanugo, or fine down, has not been shed at or near birth, but has persisted and gone on growing. This interesting theory was advanced by Ecker, who referred the persistent

lanugo and the defective teeth commonly found in hairy men to restricted development. The condition has been called 'hypotrichosis' by Bonnet, and 'trichostasis,' or 'hair stagnation,' by Unna. The last-mentioned observer, however, admits that there may also be universal hairy overgrowth after the shedding of the infantile lanugo.

4. *Local Hirsuties*.—This, the commonest form of overgrowth of hair, is a real hypertrophy of existing hairs. At certain periods of life there are waves of activity in the nutrition of the hair, notably at puberty and about forty to forty-five or fifty. At these periods the hair of the face and other parts of the body may become luxuriant in either sex. The most noticeable are development of beard or moustache in woman or of thick hair upon other parts of the body, as the chest, shoulders, or arms, at either of the periods mentioned. In the later period in both sexes the eyebrows often develop into coarse bristles, resembling the vibrissæ or 'feelers' of some of the lower animals. Long hairs also grow at times from the nostrils, ears, nose, and in other abnormal situations. In some cases the growth of hair is due to long-continued irritation, as the application of stimulating ointments. Local overgrowth of hair has been noted in connexion with fractures and other injuries. In women it is sometimes associated with menstrual and ovarian disorders.

TREATMENT.

All treatment is external, and aims at removal of the superfluous hair. That can be effected in several ways—namely, by the use of depilatories, by epilation, by shaving, by X rays, and by electrolysis.

1. *Depilatories* cannot be recommended. They are apt to leave disfiguring scars, and in very rare cases the hair

grows again with renewed vigour. If used at all they must be carefully handled, and require to be repeated at intervals of a week or two.


In the case of fine, downy hairs, the use of a 3 per cent. solution of peroxide of hydrogen has been advised, so as to bleach and render the growth less conspicuous. It should be remembered, however, that the preparation is of a stimulating nature, and likely to excite the overgrowth still further in the long run. A similar remark applies to all depilatories.

2. *Epilation*, or plucking out the hairs, is a rough-and-ready method of routing the enemy for the time being. It has the fatal objection, however, that the hairs grow again with increased vigour.

3. *Shaving* is often practised for a superfluous moustache or beard. It has to be done every day or every other day, according to the rate of growth, and may be carried out with the aid of a safety razor.

4. *Electrolysis*.—This is the only satisfactory method. It consists in destroying the hair-papilla by a galvanic current, which is introduced by means of a fine needle thrust into the hair-follicle. The needle is fixed in a holder, and connected with the negative pole, while the patient completes the circuit at a given signal by firmly grasping a sponge or cotton electrode, moistened with salt and water, in the palm of the hand. The circuit should not be completed until the needle is inserted, and it should be broken before the needle is withdrawn. The time required for each hair varies from ten to thirty seconds or more, and is denoted by a slight frothing or bubbling that appears by the side of the needle. The destruction of the hair is shown by its being easily extracted from the follicle. If there be any resistance the needle should be reintroduced. When hairs are

close together it is better to leave alternate hairs to be dealt with at another sitting. A good light is required and a lens is of great assistance.

The drawbacks of electrolysis are various. It is a tedious operation, demanding patience on the part both of the operator and of the patient. It is painful, although not unbearable, and patients differ much in their power of endurance; the use of cocaine affords little relief. In a certain number of hairs, no matter how skilfully it has been performed, there will be recurrence of growth. It sometimes misses the hair-follicle, which may be curved like the  of a bass clef in music, especially where the hairs have been repeatedly plucked out. To compensate the operator at all adequately for its performance, it becomes a somewhat costly process. Yet, in spite of all drawbacks, electrolysis is by far the best treatment for superfluous hairs.

5. *X-Ray Treatment*.—Exposure to the focus-tube from which the X rays are emitted has been found to cause local shedding of hair. Regrowth, however, has usually followed where the destructive process has not been carried to such an extent as to cause deep scarring. Exposure to the focus-tube has been extensively used for depilation, but it is tedious, costly, and uncertain in its results, even in the most skilled hands. It should be applied only by medical experts, as instances of considerable injury and disfigurement have been reported from its application by non-medical operators. As the hair grows again after a time, it becomes necessary to make a further application of the method. After a considerable number of exposures it has been claimed that the hair finally ceases to be reproduced. The method, however, has been practically abandoned.

III. Acquired Hypertrichosis.

A passing mention only is required of the development of coarse hairs that sometimes takes place in acromegaly, myxœdema, and other diseases. A luxuriant growth of hair is often noticed in tubercular patients.

ATROPHY OF HAIR

may be divided into (a) congenital, and (b) acquired.

(a) In the congenital form, also called hypotrichosis congenita (Bonnet), the infant is born bald owing to an error in development.

Bonnet,* who has paid considerable attention to this subject, has divided these abnormalities as follows:

1. *Congenital Hypotrichosis*, associated with deficiencies or irregularities in the teeth and nails.

2. *Congenital Hypotrichosis*, without such accompanying defects.

3. The commonest form, which is characterized by late development and appearance of the hair.

A few cases have been recorded of small bald patches at birth, or *hypotrichosis congenita circumscripta*.

(b) Acquired atrophy (shedding of hair and baldness).

SHEDDING OF HAIR AND BALDNESS

It may safely be said that there is hardly any single subject in the whole range of disease that demands more careful investigation and candid and skilful handling than that dealt with in this section. So far from the treatment of hair-shedding and baldness being within the grasp of the unlearned, it is in truth an art that requires the best

* Bonnet, *Anatomische*, Heft i., Abt. 3, 1892.

energies of a physician who is competent and experienced in all branches of his profession. Such a man alone can realize the full bearings of local and general conditions upon the case of each individual patient. He must have special experience, moreover, for without that training it is impossible to arrive at a correct diagnosis and to judge correctly how far the loss of hair may be arrested or cured. In short, the physician must be able to weigh all the facts of the case in forming an opinion as to the cause of the trouble before he can frame either a trustworthy plan of treatment or that forecast of the future which is often a matter of supreme importance to the patient.

In man early baldness may fairly be styled a calamity; but, as years roll by, he troubles less about his personal appearance, and at length becomes reconciled to the hairless scalp that civilization has learned to associate with advancing years. That baldness need not necessarily be the badge of senility is shown by the many men who keep a luxuriant crop of hair upon their heads until the end of their days. Some philosophers go so far as to say that baldness in the male has attained the rank of a sexual attraction, so much has the eye of the female become accustomed to the hairless crown in the opposite sex. The shaving of the male head that prevails in China may perhaps be quoted as an example of the sexual attractiveness of the hairless scalp; but, on the other hand, the baldness is relieved by the particularly long and luxuriant 'pigtail,' cultivated from the centre of the crown. Then, again, Chinese women pay great attention to the dressing of their own hair, whatever may be their particular ideal of beauty as regards men.

So far as women generally are concerned, there need be no hesitation in asserting that to them thin hair or baldness is a real misfortune, which may materially

lessen, or even destroy, the happiness of a lifetime. It needs little argument to prove that any woman who falls short of the standard of physical attractiveness fixed by natural laws among her countrywomen is thereby more or less seriously handicapped in the battle of life.

Can anything be done to arrest or cure the condition of baldness? The answer to that question is emphatically, 'Yes, if the case be taken at an early enough stage, and if the treatment be skilled and thorough.' To say that all cases of baldness can be benefited, irrespective of the age and the peculiarities of the patient, would be to rival the quack who professes to cure all baldness with a single remedy.

On the other hand, to say that some cases can be cured is merely to express a truism of medical practice. If one may put the matter briefly, the hair requires to be treated like the skin. When anything is amiss in either case remedies have to be varied, sometimes even from day to day, in order to meet the varying phases of the malady. With the hair, as with the skin, it is more than half the battle for the patient to be under the eye of the physician. To take a single illustration: Washing the head is at times one of the most valuable remedial means that can be applied to the scalp, while at others it is most harmful. The patient who is ordered to wash the head at the time of one consultation may be doing the worst thing possible by continuing that form of treatment a few months later. That is where the evil of the proprietary hair-lotion arises. In ninety-nine cases out of a hundred the key to its activity lies in its power as a strong stimulant. In some conditions, used at the right time, it may prove beneficial, but applied as the sole remedy for all sorts and all stages of baldness, it becomes simply a snare and a delusion, opposed to all sound

principles of scientific medicine. Besides, it is hopeless, in many cases of premature baldness, to expect permanent improvement in the condition without careful attention to the general health of the patient.

As shedding of hair is simply an early stage of baldness, both conditions may be considered together. An endeavour will be made to sketch the main features of the diagnosis and treatment of the condition as met with in the everyday practice of the hospital and the consulting-room. For this purpose there will be no need for anything like an elaborate classification.

Predisposing Causes of Baldness.

Age.—This constitutes an important element in atrophy of the hair-bulbs, although, from what is said below, it would seem as if the influence is, to a great extent, more apparent than real. From forty to forty-five years of age the period of so-called senile atrophy of hair sets in, so far as the scalp is concerned. Baldness before that time is conveniently termed 'premature.' It is not easy to understand, however, why 'senile' atrophy should be confined to the scalp, and usually to one portion only of the scalp. At the very period when the crown of the head becomes denuded of hair, a vigorous wave of increased growth often occurs in the eyebrows, eyelashes, armpits, chest, and pubic regions.

Then, again, it is difficult to see why, if middle-age baldness be essentially a senile change, many old men should nevertheless preserve a thick crop of hair until the last day of their lives. For some reason or other the hair under those circumstances has escaped atrophy, although it may exhibit to the utmost extent another change that is undoubtedly connected with senile degeneration—to wit, loss of natural colour.

Amongst women, a disfiguring growth on the lips and chin often marks the general tendency to exuberance of hair-growth in middle age. On the whole, there seems to be a good deal of reasonableness in the contention that so-called 'senile' baldness is an accidental and not an essential circumstance of advancing age; in other words, that it is the result of disease rather than of natural degenerate processes. At the same time, there appears to be no doubt that the impaired resistance of the tissues as age advances will enable any existing seborrhœa to make more rapid headway. Looked at from that point of view, age plays an important predisposing part in the production of baldness.

Lastly, the secretion of certain glands, such as the thyroid, the suprarenal capsules, and, in women, the ovaries, has a definite stimulating influence upon the growth of hair. It is possible that the atrophy of these structures in old age may to some extent explain the atrophic changes in the hair.

Sex.—Baldness is undoubtedly far more common among men than among women. That fact is most likely due to the differing treatment of the hair by the two sexes. Modern man—as already pointed out—pays frequent visits to the barber's shop, and constantly uses strange combs and brushes at hotels, clubs, and other places. All these things encourage the invasion of the male scalp by micro-organisms, which must be regarded as the mainspring of the mischief if we accept the view that most cases of baldness are due to infective processes.

On the other hand, the comparative immunity of women may be to some extent accounted for by the fact that a mass of thick long hair is more likely to exclude chance micro-organisms than the short-cropped hair of

the male. Long hair, again, tends to prevent direct contact of an infected brush or hat-lining with the scalp.

Environment.—The influence of civilization in producing baldness is an interesting point. As a matter of fact, baldness is practically unknown among savages living in a state of nature. That fact cannot be due to the constant exposure of the head, because many native races habitually wear a head-covering. Then, again, baldness is common enough among negroes living under civilized conditions, possibly because of the use of hair-brushes and the patronage of barbers' shops, not to mention their introduction to measles and other infectious maladies. Another fact is that civilized folk are prone to habits of luxury that predispose to atrophies and degenerations.

Constitution.—There can be no question that the strength and the power of reproduction of the hair are closely related to the general health of the individual. Anæmia, as the result of varied conditions, is often attended by thinning and loss of hair.

The gouty and rheumatic states indirectly affect the growth and nutrition of the hair, just as they often do that of the nails; at least, that seems to be the opinion of most dermatologists. They appear to act by making the soil, so to speak, fitted for the growth of the invading micro-organisms, especially those of seborrhœa.

Exciting Causes of Baldness.

These may be divided conveniently into: (a) general, (b) local, of which groups the latter is by far the more important.

(a) *General.*—In many diseases of the system generally, as in the acute fevers, the hair is shed in quantity. After scarlatina, measles, and many of the fevers

attended with symptomatic rashes, thinning of the hair, and sometimes even complete baldness, is extremely common. The nutrition of the hair-bulb apparently suffers from the same eruption that involves the general skin-covering, for the scalp is nothing more than a specially modified portion of the integument. A similar observation applies to syphilitic baldness as an early toxic manifestation of the disorder.

In all the above-mentioned cases the growth of the hair may, as a rule, be quickly re-established by appropriate local and constitutional treatment. Where no remedies are used, however, the transient shedding of hair may drift into permanent baldness. The writer has not infrequently met with cases of thin hair and baldness that could be distinctly traced to acute illness, often measles, that had occurred many years previously.

After a routine inquiry into some thousands of cases of seborrhœa in hospital and private practice, the writer can testify that in severe attacks a history of rheumatism, gout, anæmia, consumption, or other malady is almost invariably to be found in the family or personal history of the patient. In this connexion it is interesting to note that dyspepsia and neuritis are constantly associated with premature baldness. Many cases of dry skin and falling hair seem to be definitely connected with constipation. In one case of cancer the author has seen the short hair on the arms and legs so loosened that it could be plucked away painlessly with the utmost ease. Speaking generally, any toxic condition of the blood, acute or chronic, may lead to shedding of hair. In spite of many interesting facts noted on this point, it has not been possible so far to arrive at anything beyond the above general conclusion.

In the foregoing cases the hair damage may result

from the action of blood-borne toxins on the nutrition of the bulb, or from the effects of the local inflammation of the scalp. The influence of cancer on the hair generally is possibly toxic. A similar observation is true of advanced lung consumption, and in both diseases the shedding of the hair may be attributed to a bad nutrition of the skin and its appendages by a blood-supply that is defective both in quantity and in quality. In early consumption and in persons who inherit a tubercular taint it is interesting to note that there is commonly a marked tendency to overgrowth of hair. It may be that both the night sweats and the increased hair-growth are due to the excretory toxic irritation of the tuberculin that is thrown off by the skin. It is also worthy of note that babies suffering from inherited disease have often a luxuriant growth of hair.

In myxoedema the hair becomes dry, thin, and coarse; it may fall off in bands or patches, or be altogether lost; at the same time it may become grey or white, but more commonly grey over the forehead, while spattered white hairs appear on the top of the head. These most interesting changes appear to be definitely connected with defective thyroid gland secretion, more especially as the hair-growth may sometimes be restored by feeding patients with thyroid gland.

These facts have greatly modified modern views with regard to the influence of general bodily conditions upon the growth and nutrition of the skin and its appendages. Unfortunately, thyroid gland has not been found to act as a general stimulant to the growth of the hair lost under the ordinary circumstances of premature or senile baldness. The internal secretion of the thyroid gland is necessary in some way to the proper growth and nutrition of hair. Acting on this hint, the author has

obtained gratifying results from electrical stimulation where enlargement of the thyroid gland exists together with changes in the hair. He has also found in these cases an almost invariable association with a high forehead that has existed from birth (see p. 42).

(b) *Local*.—It will be convenient to preface this subsection with a few general remarks. In the first place, it may be pointed out that the nutrition of the hair is effected through the bulb. That it also takes place to some extent through the cells of the root-sheath may be inferred from the fact that a hair sometimes survives when separated from the bulb, when it is called a 'bed hair' by Unna.

As already stated, in general constitutional diseases the nutrition of the hair suffers along with other structures from 'poverty' of blood, or it may be from toxins circulating in the blood, or from micro-organisms, drugs, or other irritants that give rise to inflammations of the skin. The nutrition of the hair may also be impaired by nervous influences. Many instances have been recorded by good observers where either patchy or complete baldness has followed blows upon the head or mental shock. Neuralgia of the scalp, with tenderness, is often met with in pronounced cases of hair-shedding and greyness.

ALOPECIA AREATA

This condition means baldness in bands or patches appearing suddenly on any hairy part of the body, but most commonly on the scalp or beard and moustache. At times there may be a slight itching before the hair falls out, leaving a white, smooth, shining surface that justifies the classical description, 'smooth as a billiard-ball.' At the edge of an extending patch may be seen

a few short club-shaped hairs, which have been aptly compared to a printer's note of exclamation (!). If the patch grows larger, it is by extension of its edge, and sometimes several patches join and form a figure-of-eight or a variously festooned outline. The hair may also fall in bands of an inch or so in width, commonly at the margin of the hairy scalp. This often occurs across the top of the forehead, but may be at the side of the head or the nape of the neck; or the band may encircle the hairy scalp. The whole scalp may become bald, and the process may extend to the eyebrows, eyelashes, beard and moustache, armpits, pubic region; in short, the patient may not have a hair left on his whole body, and the nails are sometimes shed. Sometimes the bald patches may be accompanied with patches of white hair in other parts of the body. The author has seen a white patch on the pubes in a patient whose head was nearly hairless from alopecia areata. After the hair has grown over the patches it is often extremely apt to recur, perhaps for many years together. Age has a great deal to do with the chances of recovery, and cases where the whole of the hair is lost are distinctly less favourable.

Causation.—The disease, which is fairly common, occurs most frequently between ten and forty years of age. It is not much influenced, apparently, by the colour of the hair or the social position of the patient.

There are two theories of the origin of alopecia areata: one, that it is due to nerve, and the other to parasitic, disturbance. Both these views are so well supported by established facts that it is impossible to doubt the occurrence of both classes. The parasitic class is described on page 43.

The nerve or trophoneurotic cases comprise patches of baldness following injury to the head, or occurring along

the course of a nerve. Severe neuralgia is often met with in these patients, and the hair, when restored, often remains permanently white. In one interesting case under the author's care a patient had a small round patch over the left frontal portion of the scalp. There was some wasting on the left side of the face, and on inquiry a history was obtained of erysipelas and facial paralysis some years previously. In another case four sisters were under treatment at various times for band alopecias of varying extent. All were neurotic, and suffered from fine tremors and neuralgia, and one developed Graves' disease. The mother also suffered from bald patches in early life.

The connexion between diseases of the thyroid gland and patches of baldness is well known. The removal of the thyroid gland in rabbits is followed by the falling of hair in rounded areas. Myxœdema, due to absence or suppression of thyroid gland secretion, is followed by greyness and shedding of hair, which becomes coarse and is sometimes entirely lost. The author has noted that a band area of frontal baldness persists in some children. In popular language this would be described as a 'high forehead from birth.' It was present in the above-mentioned four sisters, one of whom developed Graves' disease or exophthalmic goitre, with its overgrowth of thyroid gland and its presumable excess of thyroid secretion. Further inquiry showed that many adults in whom the congenital high forehead persisted had one or more of the well-marked signs and symptoms of exophthalmic goitre—namely, tremors, quick pulse, prominent eyeballs, and enlarged thyroid gland. The congenital frontal band has been found in all cases of exophthalmic goitre in adults so far examined. It is yet too early to say whether this sign is always present in that disease,

but there appears to be good ground for suspecting that the high forehead is connected with a special predisposition to the development of nervousness, tremor, and the other phenomena of exophthalmic goitre. There is happily a practical side to this interesting observation. It is possible to bring great relief or cure to all except the most advanced cases of exophthalmic goitre by appropriate electrical treatment. Nervousness and tremors often disappear as if under the influence of a charm, and the hair condition improves under the same influence. Obstinate patches of alopecia that have resisted all other forms of treatment and have existed for years may be in some cases cured by high-frequency or the galvanic current. Where a patient suffering from patchy baldness shows tremors and nervousness, the hint for successful treatment of all these troubles by electricity may be found in the congenital high forehead. In such patients the occurrence of the shock of some accident or fright may induce alopecia patches or exophthalmic goitre.

The causation of bald patches may be due to other influences than the thyroid gland. A large class is connected with headaches and neuralgia, the so-called neurotic form. To that and to neuro-vascular and neuro-trophic origins may be ascribed the great majority of cases of alopecia areata. At the same time, there can be little doubt that, although the parasitic class has not been completely established by the demonstration of its fungus or bacterium, yet many of the characters of some forms of alopecia areata place it among the infectious diseases. The methods of onset and of growth are suggestive, while the many cases of outbreaks in schools and barracks recorded by competent observers bring the question of infectiveness within the region of reasonable certainty. It is to be remembered that no specific

micro-organism has been demonstrated in small-pox, scarlatina, and other diseases that are, beyond a doubt, of microbic origin.

Sabouraud has described a short bacillus in the sheath or substance of the hair, which he regards as the cause, not only of alopecia areata, but also of acne and seborrhœa. His chief ground with regard to areata is that by injecting the toxin of his short bacillus into guinea-pigs he has produced bald patches. His observations have not been universally adopted. His particular organisms appear to be the same described by Thin some years previously.

Alopecia areata has long been ascribed by error to the fungus known as Microsporon Andouini, which is really the small-spored ringworm fungus discovered by Gruby in 1843.

Another theory connects areata patches with pre-existing ringworm. Although it may be that now and then a case of bald ringworm may be mistaken for alopecia areata, yet there is little direct evidence to connect ringworm and alopecia areata together as cause and effect. The following case is of some interest in this connexion:

A. B., a female, married, aged thirty-nine, came to the Western Skin Hospital, London, complaining of a bald patch on the right side of her head. She called it a ringworm, and stated that three of her children had recently recovered from the complaint. The bald patch was smooth and white; the hair had fallen from it suddenly some three weeks previously. On closer questioning she remembered being visited shortly before by a female relative who had some bald places on the scalp and who had used the patient's brush. Here was exposure of an adult to the two infections, ringworm and alopecia areata, of which the latter was contracted. A child under similar circumstances would have been more prone to the ringworm, but might possibly have 'caught' both maladies.

DIAGNOSIS.—Bald patches may be caused by various maladies. As a rule, alopecia areata may be readily distinguished by its history and appearance. Nerve baldness, local and general, may be recognized by the history of shock or of injury to the head, the accompanying neuralgia, and, commonly, by the high forehead. Microscopically, the root is atrophied, and the free end frayed into a fringe.

In ringworm the surface of the patch is usually more or less red and scurfy, and the hairs that are left are broken off short, twisted in various directions, and often resemble black dots. In alopecia areata, on the other hand, the hair-follicles are empty and the scalp smooth, except, perhaps, for a few 'club' hairs at the active margin. The microscope settles the question.

In lupus erythematosus the affected smooth area is not distinctively rounded or oval in shape, and its central part is thickened and firm, unlike the soft, smooth, thinnish texture of the areata scalp.

VARIETIES.—Alopecia areata may be thus classified for practical purposes :

1. Alopecia neuritica.
2. Alopecia areata, or parasitica.
3. Alopecia universalis.

PROGNOSIS.—The prospects of recovery are good, provided the patient be not older than forty or forty-five. After that period the likelihood of cure becomes less and less. The chances are also much less in universal cases than when the malady is confined to the patchy type. Under ordinary treatment, however, the growth of hair may not return under two or three years, although in young and healthy subjects it may appear in as many weeks. The hair, especially in older patients, may remain permanently white after regrowth.

TREATMENT.—The chief drug remedies are stimulant and antiparasitic. Whatever remedies be used, it is necessary to recognize the occasional obstinate nature of the affection. (Sulphur, resorcin, turpentine, strong ammonia, salicylic acid, pure carbolic acid, chrysarobin, and cantharides are all useful.) Care must be exercised in the application, so as not to do harm by over-stimulation. In this, as in most other affections of the skin and appendages, a change in remedies is often of value.

Perchloride of mercury is advised by some authorities. If used, it should never be applied except under the supervision of the medical attendant. Fatal cases have been recorded from the use of hair-washes containing this highly poisonous drug.

It is desirable to remove any loose hairs around a patch, as they are involved in the process. The whole scalp may be washed with spirits of soap once or twice a week or with ordinary soft-soap. In extensive baldness it may be well to shave the head now and then. Brushes should be disinfected every day or two by steeping in a disinfectant. Should the patient wear a wig, it should be systematically disinfected by baking in an oven (first wrapping it in paper), or kept from contact with the scalp by some thin material, as very fine silk or cambric, that can be renewed daily or disinfected with boiling water.

A form of stimulation of the utmost value is electricity, applied by means of a wire brush or a sponge electrode either daily or every two or three days. The writer has recently obtained brilliant results from the application of the continuous current, to which his attention was first drawn by his colleague, Dr. Arthur Harries.

In some cases, notably where there is headache or

associated neuritis, the high-frequency current is often most satisfactory in its results.

Internal treatment may be required to remedy any defect in the general health.

Another agent that is worth a trial is the Tallerman superheated air treatment. This may be used locally, but is chiefly indicated when the patient is suffering from gout or rheumatism or 'rheumatic gout,' or has a family history of rheumatism.

Useful formulæ are:

R Sulphuris sublimati	..	...	̄ss.
Glycerini	...	...	̄iii.
Unguenti simplicis	...	...	̄iii.

Misce; fiat unguentum. Sig.: To be rubbed in firmly night and morning.

R Lysol	...	...	̄i.
Spiritus vini rectificati		...	̄i.
Aquam rosæ	...	...	ad ̄vi.

Misce; fiat lotio. Sig.: As above.

There is a form of patchy baldness attended with depression or deep scarring, so that the smooth, polished, and level surface of the typical areata patch is lost. This variety is called Alopecia Circumscripta Orbicularis by some authorities. In the following interesting case both varieties were present, and the depressed form occurred as rounded, shallow excavations situated upon the smooth bald area patches. Two differing processes were apparently going on simultaneously. The patient died of malignant disease of the liver two years later—a fact that suggests the possibility of the depressed areas being malignant growths that had undergone atrophy.

T. P., a female, aged thirty-eight, married, nine children, all healthy; complaining of bald patches on scalp and neuralgia.

There was a small red patch over left parietal and general large typical areata patches, having in their smooth, bald surface rounded depressed areas. Patient had bad teeth, looked unhealthy, had 'always suffered from indigestion,' had a puffy erythema of both under-lids, and complained of left facial neuralgia. In February, 1895, there were dry, scurfy seborrhœic patches on scalp, and some downy hair had grown on bald surfaces. In June of that year she complained of right supra-orbital neuralgia, associated with bilious attacks; some ova pediculi seen on hair. On March 21 the patient had a severe attack of hæmorrhage from the stomach. Not long after she died of malignant disease of the liver.

Apart from these internal causes of hair atrophy, there is a large number of outside infections which may be divided into: (1) mycoses, the gross fungi; (2) bacterial invasions; and (3) animal parasites. Of these groups, the bacterial is the most important in the causation of partial or complete baldness of the premature and senile types. The active injury to the hair appears to be due either to mechanical causes or to follicular and perifollicular damage by toxic inflammations. Invasion by both gross and minute organisms may readily take place through the mouth of the follicle, but some of the ringworm fungi actually penetrated the substance of the hair-shaft.

I. The Mycoses.

During recent years ringworm has attracted a good deal of attention, on account both of its prevalence and also of the interesting discoveries that have been made in the natural history of the fungus to which it is due.

The most ardent upholders of the present public school system would hardly assert that it has not much to answer for in the spread of ringworm. The facts of the case are simple. In ringworm of the scalp we have a highly contagious complaint, and in the schools we bring

together large numbers of children, who constitute, as it were, an open field for the growth of the invading fungus. The same may be said of Poor-Law schools, where ringworm is often extremely common, despite the care with which it is usually treated.

Unfortunately, ringworm of the scalp is regarded by many persons as a slight affection that calls for little or no treatment. So far from that being the case, however, it is from many points of view a serious malady. For instance, in spite of skilled and careful treatment, it may last for months or even years. It is apt to give rise to various secondary troubles. It may leave behind in the scalp a lifelong seborrhœa—that condition of mild, chronic inflammation which is now recognized as a fruitful source of greyness, thin hair, baldness, and not a few skin eruptions. Lastly, each child whom it attacks becomes a centre of further infection. For these and other reasons ringworm of the scalp is often a most troublesome malady, costly, tedious, and difficult to cure, entailing present suffering and future disfigurement upon the individual.

Recent Discoveries as to the Fungus.—The discovery of the causative fungus was announced by Gruby in 1841. Duclaux and Leslie Roberts cultivated it outside the body, and the latter observer reproduced the original disease by inoculation. Sabouraud, however, has made great advances in our knowledge of the subject within the last few years. He showed that the two chief varieties in man were a large-spored (*megalosporon*) and a small-spored (*microsporon*), the two never being found together on the same head.

Sabouraud's classification,* which is in essential par-

* *British Journal of Dermatology*, July to September, 1896.

ticulars accepted by English observers, is the following:

(a) Small-spored tineæ (*Microsporon Audouini*.)

(b) Large-spored tineæ (*Tinea trichophytina*).

1. *Trichophyton megalosporon endothrix*.

2. *Trichophyton megalosporon ectothrix*.

(a) **The Small-spored Tinea** (*Microsporon Audouini*) is by far the more common in children, being met with in two-thirds or more of the cases. Its mycelium tubes grow outside and in the substance of the hair, but the spores form a dense 'mosaic' layer or sheath round the shaft. There are few species of the microsporon, and, with the exception of one found upon the horse, they are human parasites. It is rebellious to ordinary treatment. According to Sabouraud, it is never found either on the head or on the beard of adults, but this has been contradicted by other English observers.

(b) **Large-spored Tinea**—1. *Trichophyton Megalosporon Endothrix*.—The fungus is found chiefly inside the hair, the epithelial covering of which is left intact. Its spores are somewhat larger, and are arranged in rosary fashion. It is now and then met with in children, and rarely in the scalp of adults. It does not affect either the beard or the nails, but sometimes invades the skin. Sabouraud regards it as exclusively human, and says it is easier to cure than microsporon. Aldersmith,* on the other hand, regards it as the cause of obstinate cases of 'black dot' ringworm. The latter kind belongs to the (a) *fragile* variety of the large-spored endothrix, which is far less common than the other, or (b) *resistant*, variety.

2. *Trichophyton Megalosporon Ectothrix*.—This is more frequently met with on the body than on the scalp, but

* 'Ringworm,' 1897, p. 24.

neither is common. It is essentially an animal tinea (Sabouraud). It causes tinea circinata, or ringworm of the body, as well as ringworm of the beard and of the nails, and is answerable for most cases of pustular ringworm and kerion of the scalp. The fungus is found mainly outside the hair, but some of it is nearly always to be found also inside the shaft. Many varieties have been described, such as those of the calf, cat, horse, and of various birds.

These researches, which proved the plurality of the ringworm fungi, have been extended by many observers. When cultivated outside the body in an artificial medium (Sabouraud uses a peptone-maltose agar-agar), the microsporon shows a downy surface and white colour, whereas the megalosporon has a powdery surface, with branching rays and often a yellowish tint.

Methods of Infection.—Among school-children the most common mode of infection is by the accidental or playful exchange of caps. Brushes and combs, pillows and bedclothes, and to a less extent towels, no doubt often convey the disease. Now and then domestic animals, as cats, dogs, or horses, are answerable. In a great many cases, however, it is impossible to trace the origin of the mischief.

Reinfection and Multiple Infection.—A patient suffering from ringworm of the head runs the risks of reinfection no less than of multiple infection from his head-gear. The lining of his hat or cap becomes laden with spores, which may effectually prevent cure by starting the disease in fresh parts of the scalp. Children affected with ringworm often wear long worsted 'fisher' caps. The woollen material gets loaded with short hair-stumps and spores from the diseased patches—as may be readily proved by the microscope—so that in

pulling the tightly-fitting cap into position fresh spores are scattered broadcast over the whole scalp. The way to avoid the danger is simple, and will be described under prevention.

Forms of Ringworm.—Ringworm may attack any part of the surface of the body. When it gives rise to spreading rings or ovals of various sizes on smooth skin it is known as (*a*) *tinea circinata*. Or it may attack the hairy parts: on the beard it is known as (*b*) *tinea barbæ* or *tinea sycosis*; and on the scalp as (*c*) *tinea tonsurans*. The meaning of 'tinea' is a moth-worm, applied to this disease from the moth-eaten look of the patches.

(*a*) *Tinea* of the body, or *tinea circinata*, may be recognized as a circular or oval desquamating patch, which has developed steadily from a small red point of origin. The edge of the patch is reddish, raised, and sharply defined, while its centre is discoloured and dotted with fine scales, or the whole surface may become inflamed. There may be one or more such patches, often on uncovered parts, as the face, neck, or hands, or several of the rings may run together and form a festoon or figure-of-eight pattern. This circinate form is often caught from dogs or horses, and may attack folk of all ages. This latter fact separates it sharply from the small-spored ringworm of the scalp, which is essentially a disease of children, and is of extremely rare occurrence after fifteen or sixteen years of age.

Tinea circinata may be often recognized by its naked-eye appearances, but a microscopic examination should be made in every case. Some scales from the edge of the ring should be removed with a blunt scraper, which has been previously moistened with a little liquor potassæ. These are put under a cover-glass on a slide with a few drops of the potash solution, and examined with a quarter-

inch objective. The mycelium threads are abundant, but the spores few. The former are long, delicate rods, branching here and there, and broken up into sections of different length.

Tinea cruris is simply a ringworm on the armpits or crutch. Its old name was eczema marginatum. It is red and often moist with a red raised border, which is scaly, papular or vesicular. Owing to the warmth and moisture of the parts the growth of the fungus is luxuriant, and itching is a marked symptom. It is a fairly common affection in the United Kingdom, but is far more common in warm climates, where it is known by the names of Indian, Chinese, or Burmese ringworm, or Dhobie's itch. The disease is not difficult to cure by the ordinary parasiticide remedies; but sulphurous acid, either pure or diluted with glycerine and water, appears to be a specially suitable application.

The treatment of *tinea circinata* is simple as it is satisfactory. A single painting of the affected surface with tincture of iodine often suffices to kill the fungus, which, however, may require the stronger liniment of iodine or even a blister. If an ointment be preferred, one composed of half a drachm each of pure carbolic acid and of salicylic acid to the ounce of vaseline may be worn continuously on lint beneath oil silk. Should the patch be inflamed and pustular, the inflammation should be subdued with soothing lotions, as calamine or weak boracic acid. The writer has found salt and hypsulphite of soda (of each 20 grains), with a drachm of glycerine to an ounce of water, a good application for these cases, especially when the disease has attacked the face.

(b) *Tinea sycosis*, ringworm of the beard or eyebrows, is usually of the large-spored variety, and most common in

young male adults. It is often contracted at the barber's, either from an infected razor or more probably from an infected lathering brush. It begins as a small red more or less scaly spot, in the centre of which is a hair. This spot spreads, and sometimes forms a ring. At length many hairs are involved. Their follicles inflame and form numerous pustules. As a rule, beard ringworm is chronic, disfiguring, and extremely rebellious to treatment. It is often the seat of severe itching and sometimes of a diffuse eczema, with brawny thickening of tissues. It may end in scarring and permanent baldness. Its recognition usually presents little difficulty, but an examination under the microscope should always be made. In that way it may be separated from ordinary non-parasitic folliculitis or eczema of hairy parts. Pathologically, *tinea barbæ* is an infective folliculitis and perifolliculitis, set up by the presence of the trichophyton. It is characterized by its attacking the hairy parts of the face, by its loosening of hairs, by its 'lumpy' swellings, by its steady spread, and by the early and constant presence of pus. At the same time, there is no serous discharge or 'weeping.' X-ray treatment is often most valuable, and a single exposure sometimes suffices to reduce the multiple swellings.

(v) *Tinea tonsurans*, or ringworm of the scalp, comprises the large- and the small-spored varieties above described. In the small-spored a rounded patch of varying size is seen on the scalp. The hairs of this diseased area are short, stubby, often darker than usual, and twisted and bent in various directions, while the scalp is more or less scaly and bald. In the large-spored variety the patch is either bald or some stumps are present as 'black dots.'

Kerion is a complication that may attack any kind of

ringworm patch. It consists of an inflammatory swelling, with redness and glazing and a certain amount of moist secretion. Purulent points sometimes occur, and the hairs are loosened. Kerion is usually regarded as Nature's attempt at cure, and on that ground it is artificially produced by some plans of treatment. It is not common on the scalp, but is much more frequently met with in ringworm of the beard.

Under the microscope the hair, treated with liquor potassæ, usually displays short-jointed threads in its substance. Sabouraud calls this endothrix, and says parasitic sycosis is always due to a large-spored variety derived from the horse. It seems likely, however, that the hairy parts of the face may be attacked by several varieties of ringworm. The diseased hairs become loose, and may be easily pulled out. For examination, it is best to take a hair from the spreading edge. Prolonged soaking in the potash solution is sometimes needed to display the fungus.

The method of staining the fungus is as follows: (1) Stain in gentian anilin violet (made in the usual way by the addition of a few drops of saturated alcoholic solution of gentian violet to anilin water) fifteen minutes to thirty minutes; (2) one to five minutes in Gram's iodine solution; (3) decolourize in anilin oil; (4) remove anilin oil by blotting-paper, and mount in Canada balsam.

TREATMENT.—If treatment be steady and persistent, a cure may be predicted sooner or later even in obstinate cases. The disease is often extremely chronic, and apt to recur after apparent recovery.

Epilation is useful, both as a means of getting rid of the fungus and of releasing pent-up pus. It should be carried out daily over a small area. The affected hairs are seized two or three at a time with a broad, blunt

forceps and extracted. The operation is almost painless, and may be repeated, say, over half a square inch every other day. The plucking of hair should extend to apparently sound parts around the patch.

Shaving the scalp affords valuable help to the surgeon in various ways. Thus, it disposes at once of a large quantity of the fungus; it enables remedies to reach the deeper seats of the mischief; it discloses the extent of the ringworm and the progress of the case. It should be carried out once a week, and washing the scalp had perhaps best be avoided altogether unless the head be previously shaved. Some wash the head daily.

Parasiticide.—The main obstacle to cure is the difficulty of bringing the parasiticide into contact with the fungus. A good ointment is composed of pure carbolic acid and salicylic acid, each half a drachm to the ounce of vaseline. This may be rubbed into the patches with a stiff brush, which can be made by cutting short the bristles of a painter's ordinary penny brush. Applied in the right way oleate of copper ointment yields excellent results. Chrysarobin, half a drachm or a drachm to the ounce of vaseline, may be tried, but always with the greatest caution, for if the patient get a little of the drug in his eye it may cause severe suffering. A good plan is to rub the shaved scalp with pure turpentine for three or four minutes. The head is then washed with carbolic acid soap, dried, and painted over with tincture of iodine. This process may be repeated daily for a fortnight. Another plan has been found by the writer to answer well in chronic and intractable cases. After rubbing the head with turpentine, as above described, it is painted over with a solution of biniodide of mercury in spirit of the strength of 1 in 500. Each night the head is packed

with lint soaked in the following lotion, and covered in with oil silk or a rubber bathing-cap :

R Sodii chloridi...	...	...	̄i.
Olei sanitatis	...	...	̄ii.
Glycerini	...	...	̄iv.
Aquam	...	...	ad ̄x.

Misce ; fiat lotio. Sig. : Apply on lint.

Formalin has been much used of late, and may be applied in the strength of one to three of glycerine.

The X-ray treatment has practically superseded all other methods. It acts by loosening the bulbs in the follicles. Short exposures—of about ten minutes—may be given at intervals of a week or ten days. So long ago as 1898 the present writer used this method, and epilated the scalp wholesale by applying a thick layer of collodion, which, on being stripped off, brought away the loosened hair-bulbs. The method has been developed and brought into vogue by the brilliant researches of Sabouraud.

PREVENTIVE TREATMENT.—Reinfection of the patient from the cap may be prevented by wearing inside the head-covering a movable lining, which can be changed daily. If of paper, it should be burnt ; if of linen, it can be sterilized by being placed in boiling water or by being wrapped in paper and baked in an oven. Caps that have been worn without such a protective lining should be similarly disinfected in an oven, and if previously wrapped in thick brown paper will not be damaged. Brushes, no doubt, convey a great deal of infection to other persons and reinfection to the original owner. They should not be used at all for ringworm patients, and, if infected, should be soaked for half an hour in a disinfectant solution (see p. 21), and well washed with Hudson's or other strong scouring soap. All personal washing should be

conducted with great care. No two children, for instance, should be allowed to wash in the same water, neither should they use the same towels, sponges, or washing flannels. Then, again, a linen nightcap should be provided, and one pillow should be kept strictly for the patient's use, and either be covered with a piece of linen that can be scalded or a fresh pillow-slip should be provided every few days. All these points require special attention in schools.

From what has been said it will be plain that the key to success in dealing with this highly infectious disease lies in isolation. No child should be allowed to go to school who is suffering from the complaint. Moreover, Board and other schools require skilled inspection from time to time in order to weed out cases. That ringworm could eventually be banished from this country seems certain enough, if only the three common-sense rules of skilled inspection, rigid isolation, and special treatment were everywhere insisted upon.

FAVUS—TINEA FAVOSA (HONEYCOMB RINGWORM)

Favus is common among the poor in Russia, Poland, Italy, and France, but rare in America. In the United Kingdom it is common in Scotland, but far less frequent in England. In London many of the cases met with are among the foreign Jew immigrants of the East End. The present writer has met with six cases in hospital practice in the West End: two in Polish Jewesses, sisters; one, a servant girl, attacked on the cheek; one of favus on the legs in a man; and two in children. In two instances the infection was in all probability due to affected cats. In one case in private practice a patient suffered for many

years from the disease, which she had always regarded as eczema, but none of her family had contracted the malady.

The disease is due to a fungus which invades the skin or hair-follicle, and tends to grow upwards in the form of a sulphur-coloured, rounded, and cup-shaped shield or 'scutulum,' the centre of which is pierced by a hair. From a minute dot, these favus cups grow to the size of a sixpence or more, and neighbouring cups run together and form crusts, which may reach a large size. The hairs become dry, lustreless, and can be easily pulled out. After a time the crust separates and leaves a white, slightly-depressed scar, in which some hairs are usually left either scattered singly or in patches. Favus is an extremely chronic disease, rebellious to treatment. If neglected, the scalp is often infested with pediculi, and eczematous and other inflammatory processes may follow. It may also attack any part of the surface of the body, including the nails. Universal favus may end fatally from exhaustion, and in one of Kaposi's cases the fungus was found in the stomach.

ETIOLOGY.—The disease is usually conveyed by direct human infection, as in the case of ringworm, but it may also be derived from cats, dogs, rabbits, mice, and other lower animals. It is less contagious than ringworm, and is mainly found amongst the poorest classes.

PATHOLOGY.—The characteristic cups are made up almost entirely of the mycelium and spores of the fungus discovered by Schönlein in 1839, and named after him, *Achorion Schönleini*. The fungus elements can readily be seen by soaking a little of the crust in liquor potassæ and examining under a microscope, magnifying about 500 diameters. The mycelium is branched and ends in conidia, while the inner part of the hair is filled with

closely-packed chains. The hair does not break off short as in ringworm, but when extracted usually brings away the greater part of the root-sheath. The enlargement of the outer part of the scutulum that forms the 'cup' is due to the more vigorous growth of the fungus at the moist edge as compared with the dry centre. When a scutulum is removed, it leaves a moist red depression in the skin, wherein fresh fungus may develop.

TREATMENT.—Most cases will recover if treatment be persevered in for a sufficient time, which may be one or two years. Systematic removal of the crusts is essential as a first step. They may be soaked repeatedly in carbolized oil, of the strength of 1 in 40, and scraped off with a blunt knife or piece of wood. The surface should then be well washed with soft-soap and hot water, and treated with antiparasitic remedies. Epilation is another valuable method of treatment. The hairs should be plucked out daily with a broad-pointed forceps until the diseased area is cleared. Norman Walker advocates sulphate of copper rubbed into the scalp as an ointment, composed of 1 drachm of the salt to 1 ounce of lard: the writer has obtained good results with oleate of copper.

One of the best modern methods of treatment is by means of the X rays. The exposure must be made by skilled hands, or considerable damage may result. When properly applied the hairs become loose, and can be removed at a touch a week or ten days later.

Valuable applications are: Oleate of mercury (20 per cent. ointment), sulphur, chrysarobin (15 to 30 grains to 1 ounce of vaseline), formalin (10 per cent. in glycerine), resorcin (1 drachm to 1 ounce of vaseline), and hyposulphite of soda in strong solution.

A cure can be confirmed only by the microscope and by the lapse of time.

II. Bacterial Invasions.

Seborrhœa of the scalp may be defined as a chronic inflammatory process, attended with desquamation (dandruff) caused by an unknown and possibly manifold bacterial invasion, which, if untreated, results in shedding of hair and ultimate baldness. This is undoubtedly the commonest cause of all baldness, whether 'premature'—that is to say, under forty—or 'senile,' after that age. Here, again, no single micro-organism has been identified as the cause of baldness. It seems not unlikely that seborrhœa may be a sign common to invasion of the hair and sebaceous follicles by various bacteria. So far as constitutional predisposition is concerned, there is little doubt in the author's mind that the process is prone to attack persons with a rheumatic tendency, and to run a more severe course in such cases. Something of a similar kind may be said of various weakened states of the constitution, as in dyspepsia, anæmia, nervous affections, and convalescence from measles, typhoid fever, and other acute illnesses. Seborrhœa may appear on the scalp of the infant as the yellow crust, known as a 'cradle cap,' and if untreated may persist for many years. In the latter event the sufferer is liable to body rashes of various kinds, while the hair is always thin and the head scurfy, followed by early greyness and baldness.

The infective nature of seborrhœa is shown by the way in which whole families are affected with scurfy heads and premature loss and greyness of hair. In such instances it is not unlikely that the hair-brush and the comb are the chief agents in the spread of the disease.

The condition is a wide one, embracing various

degrees of severity and destructiveness. It may be conveniently divided into the dry and scaly, the crusted or greasy, and the eczematous or moist. It accounts for the vast majority of cases of baldness coming on from eighteen or twenty and forty years of age, and not improbably, for reasons already stated, it also explains many so-called 'senile' cases. The process of denudation often begins in the whorl at the back of the head known as the 'crown,' or in the smooth indentations or bays that run into the scalp from both sides of the forehead. Sometimes the first thing to draw attention is an exaggeration of the parting of the hair. When once started, the baldness progresses steadily until it is arrested by the falling out of the hair and the obliteration of the follicles.

As a rule, seborrhœa is attended with little itchiness; indeed, most of the signs and symptoms of mild seborrhœa are so slight as to escape notice. To the trained eye, however, seborrhœa is at once apparent. In young people, a glance at the coat-collar or the upper part of the dress tells the tale in the sprinkling of fine dandruff, whereby it is covered. Desquamation is a constant sign in the form of more or less fine and branny scales. Sometimes the scales come away in silvery flakes, a condition that is still called psoriasis of the scalp by some observers. It is by means of minute scales, probably, that the infection of seborrhœa is conveyed to the skin of all parts of the body, where it is answerable for many rashes. On the scalp redness may be present, often only as a faint Indian red blush, or perhaps the openings of the hair-follicles simply present a stippled look. On the other hand, the scalp may be deep red in the severer affections, with more or less local œdema or thickening of the scalp. In cases of old standing

there is usually thinning of the scalp, which becomes hard, white, and polished.

For clinical purposes the classification of Unna is convenient. He divides seborrhœic eczema into three groups, each with a corresponding alopecia :

1. *Pityriasis Capitis*. — Fine dandruff or abundant branny desquamation. Itching, as a rule, slight or absent—alopecia pityroides.

2. *Eczema Seborrhœicum Crustosum*. — Yellowish greasy crusts and scales—alopecia seborrhœica (oily seborrhœa).

3. *Eczema Seborrhœicum Madidans*. — Moist and catarrhal, greasy crusts—alopecia eczematosa.

DIAGNOSIS.—True psoriasis may be diagnosed when, on removing a mass of dry, silvery scales from the scalp, a number of bleeding points are exposed. This is confirmed when similar scaly patches exist on the tips of the elbows and below the kneecaps. Seborrhœa sometimes mimics this type of psoriasis, and should be carefully distinguished. The seborrhœic rash is not found exactly on the typical psoriasis sites—elbows and knees—and its scales are yellowish, and do not cover the patch right up to the edge. Some observers maintain that all psoriasis is of seborrhœic origin.

PROGNOSIS.—The old view of the incurable nature of the conditions that lead to baldness must be considerably modified. It is a widely accepted doctrine nowadays that the seborrhœic process can be arrested at almost any stage. How far the growth of hair in premature or senile baldness can be actually restored is another matter. Still, there is a prospect of some amount of success if the patient be young and robust. Age is an all-important factor. In persons in good general health there is every likelihood of curing seborrhœa of the scalp up to thirty or thirty-five or forty years of age, and of restoring a fair

amount of hair. After forty the chances of relieving partial baldness grow less and less, but it cannot be too strongly urged that seborrhœa can be treated at any period of life, so that the remaining hair may be saved. Patience and perseverance are required on the part of the patient; no less than skill and experience on the part of the medical attendant. The author has seen a considerable growth of downy hair take place on the bald head of a gentleman seventy years old under the combined influence of electrical and chemical stimulation, while at the same time his white hair became distinctly tinted. Cases, again, have been recorded where a vigorous growth has appeared at an advanced age. The general rule, however, is that active growth of hair cannot be looked for with any confidence after middle life.

A number of small horny warts sometimes grow on the scalp, and are almost invariably a sign of seborrhœa. They may be destroyed by caustic applications applied with careful precautions, so as not to injure the sound scalp in the neighbourhood. If large, they may be best dealt with by electrolysis. These seborrhœic warts may grow anywhere on the body, and are common on face, neck, and shoulders. Sometimes they grow to a large size in these situations, and by far the most speedy and effectual way of getting rid of them is by electrolysis.

TREATMENT.—The principles of treatment are few. Generally, attention to anæmic and other constitutional conditions are often essential, but need not be entered into here. It is often just as necessary to attend to the teeth, to the digestion, to the state of the bowels, to diet, exercise, and the treatment of gouty, rheumatic, or other maladies, as it is to apply local remedies to the scalp. Preventive treatment should be carefully attended to. Locally, the chief indications are to cleanse the scalp, to

apply sedative and stimulant remedies, according to the stage of the malady, and as far as possible to aim at asepsis.

(a) *Preventive Hygiene*.—This consists in the systematic washing of the scalp. A good antiseptic soap should be used for the purpose (p. 16), and the suds be well washed out with tepid water. The shampooing may be conveniently performed at the Turkish bath, but the patient should be careful not to reinfect his scalp by using a brush or comb after being douched. It will be better to smooth down the hair with the hands, and finish the toilet on reaching home.

During the treatment of a case of seborrhœa it is more than ever necessary to attend to the cleanliness of the hair-brushes, owing to the risk of reinfection (see p. 20). It would be difficult to imagine a more ingenious instrument for inoculating a scalp than the old-fashioned hairbrush, with its infected bristles rubbed firmly and repeatedly against the base of the hairs. The use of strange brushes at hotel lavatories is to be avoided. One way out of the difficulty would be to carry about a small washable comb in a case, or a miniature pocket brush and comb. The 'single bristle' brush is invaluable; it can be readily and effectually cleansed, dries quickly, and is comfortable to use.

(b) *Remedial Treatment*.—The scalp may be washed once or twice a week with Schmolle's soap, which alone may cure cases where slight dandruff and loss of hair are the chief signs, and where care is taken to prevent reinfection. Common yellow soft-soap acts as a stimulant, but it should not be used for more than two or three weeks at a time. A milder application is the spiritus saponis kalinus of Hebra, made by dissolving 4 ounces of green soap (*sapo viridis*) in 2 ounces of alcohol. The

head may be shampooed with this preparation at any stage of seborrhœa—in mild cases daily, but with an interval of a week or fortnight if there be much inflammation present.

When the seborrhœic head is first washed it is apt to bring away a great deal of hair, and the same is true of the application of other remedies. The patient should be warned as to the likelihood of this occurrence, and told that treatment simply removes the diseased and loosened hairs, which would shortly have dropped out of their own accord. The removal of affected hairs is likely to be of service, inasmuch as many harmful bacteria are thereby removed.

Many drugs are useful in the treatment of seborrhœa. Resorcin, of a strength of 1 drachm to 1 ounce of spirit and 3 ounces of water, forms an excellent lotion. To this may be added various stimulants, such as cantharides or strong ammonia, or detergents, such as carbolic acid or liquor carbonis detergens. Salicylic acid and sulphur are good antiseptic and stimulant remedies.

Many of the mercurial preparations are serviceable—notably ammoniated mercury, 15 grains to the ounce of petrolatum. The latter formula may be usefully combined with an equal quantity of creolin, or liquor carbonis detergens, 1 drachm to the ounce of petrolatum. Where there is much inflammation and moist eczematous discharge a simple soothing ointment is often the best application. To that some mild antiseptic drug may be cautiously added as the inflammation subsides. In some cases it is necessary to remove the crusts by soaking them in oil, and in others this remedy has to be continuously applied to secure its beneficial effect.

Ointment.

R Creolini	...	...	...	̄ss.
Hydrargyri ammoniati	...	...	...	grs. v.
Vaselini	...	...	ad	̄i.

Misce ; fiat unguentum.

Ointments may be rubbed into the scalp with the fingers, or, better still, with a small brush. They are objectionable to most patients when applied to the hair, especially in the case of women. Fortunately, in most cases it is easy to substitute a simple antiseptic and stimulant lotion.

Eau de Cologne can be added to any of these lotions, which are thereby rendered pleasanter to apply. Corrosive sublimate forms a valuable antiseptic, but must, of course, be used with great caution, as cases of fatal poisoning have occurred therefrom. The lotions can be rubbed into the hair with a small brush, shaped like a long thin plate-brush, except in the case of the corrosive sublimate, which should never be applied in that way, as it is apt to accumulate to a dangerous extent on the bristles. It is important to wash the lotion brush every few days. A convenient way of applying lotion is by means of a drop-bottle, such as that used for scent, whereby some of the stuff may be shaken on to the head and well brushed in, or it may be put on the hair-brush.

The following is a good detergent lotion for dry and scurfy heads :

R Liquoris picis carbonis	...	...	̄i.
Acidi borici pulv.	...	...	grs. xx.
Olei ricini	...	...	̄ii.
Tincturæ quillaie rectificatæ	...	...	̄i.
Spiritus rectificati	...	ad	̄viii.

Misce ; fiat lotio.

A good way of stimulating the scalp is by dry-brush-

ing. Where the tissues of the patient are not too atrophied, baldness of the temples and crown may sometimes be successfully healed by recent developments of electrical treatment. It is not proposed to enter into details here, but it may be stated that the methods are dangerous in the hands of non-medical operators, who do not possess the knowledge of physiological and pathological symptoms necessary for the safety of the patient. The author has obtained better results with galvanism, given the conditions of a favourable age and the non-destruction of the hair-follicles, than by any other plan of treatment. In actual baldness blistering is sometimes useful in restoring a growth of hair.

Eczema.—In a pure eczema of the scalp the inflammation may be erythematous, or be marked with papules, vesicles, pustules or dry scales. The typical lesion has yellowish honey-like or greenish crusts. Pustular varieties are commoner in children and scaly in adults. Eczematous conditions are often found along with seborrhœa of the scalp. Their great distinguishing feature is that when the crusts or scales of eczema are removed the underlying skin is inflamed; whereas the removal of the greasy crusts of seborrhœa simply reveals a greasy non-inflammatory surface. In acute weeping eczema the hairs are matted together with the yellowish crusts, and there is not the tendency to loosen the hairs and cause baldness that is so strongly marked in seborrhœa.

In eczema there is a constant tendency to inflammation of the lymphatic glands, especially in the neck and at the back of the ears, and abscesses in those situations are common.

In many cases the cause is the irritation due to pediculi, or head lice. In others the irritant is less

obvious. In typical acute cases 'a predisposition on the part of the patient towards eczema is usually present.

Treatment is mainly local, and much the same as for seborrhœa. It is a first essential to remove all crusts, which may be done by washing with warm weak solution of bicarbonate of soda or with warm oatmeal-water. The usual remedies, such as calamine, ammoniated mercury, and sedatives, may be applied in the acute stages, and the tars and antiseptics, such as carbolic and salicylic acid applications, later. In acute cases in children the writer uses salicylic acid and other antiseptics, with equal parts of starch and oxide of zinc as a dusting-powder. In pustular conditions the addition of a drachm of euophen to the ounce is useful.

Psoriasis.—It is not unlikely that the diseased condition hitherto described as psoriasis is nothing but a dry chronic seborrhœa. In any case it is almost certainly due to bacterial invasion. The rounded patches growing at the edges and covered with heaped-up scales, that when removed leave a reddened base with small bleeding points, is familiar enough; but this pure type with scaly patches on the elbows and below the kneecaps is not by any means a common affection. The seborrhœa or bastard psoriasis, as some call it, has its origin in the scalp. The treatment of psoriasis and psoriasis-like conditions is that of chronic seborrhœa. Tar, sulphur, salicylic acid, chrysarobin and ammoniated mercury are all useful preparations. The removal of scales is important, and may be effected by the use of soap in the way already mentioned.

Sycosis—Coccogenic Sycosis.—This term formerly included ringworm of the beard. It will be used here to mean a pustular affection—a kind of acne of the beard,

moustache, and coarse hairs, or 'non-parasitic sycosis.' It is an acute or chronic papular and pustular inflammatory affection of the hair-follicles and perifollicular tissues in the beard and moustache region, but may also occur in any other part of the body where the hair is coarse. The typical lesion is perforated by a hair at one period of its existence.

The word is derived from the Greek name for a fig, from a fancied resemblance of the inflamed chin to the inside of a fresh, ripe fig. Although the disease has been called 'non-parasitic,' it is really so only in the sense that there is no coarse fungus present like that of ringworm; but it is nevertheless parasitic, inasmuch as it is caused by pus-producing bacteria, possibly or probably of various kinds. The commonest organisms are *Staphylococcus aureus* and *albus*; but in addition to the 'coccogenic sycosis,' Unna has described a 'bacillogenic' form connected with a special bacillus.

The acute stage is usually marked with numerous pustules, from which in the later stages the hairs can be readily extracted. During the early papular stages the hairs are firmly fixed. The whole process is one of sharp inflammatory reaction, which may involve a considerable area, and be attended with diffuse as well as follicular and perifollicular inflammation. The disease is apt to be extremely chronic, extending over years, and the affected tissues may develop elevated excrescences, boils, deep abscesses, crusts and scales, thickened skin, nodules, scars, and local baldness; in a word, all the signs of severe, chronic, pustular inflammation. It has a marked tendency to relapse.

A chronic variety is that which involves the moustache below one or both nostrils. The affected surface is red, somewhat thickened, and scaly or crusted, and devoid of

hair. The cause is nasal catarrh, which must be cured as a first step in the treatment of the lip.

Sycosis is sometimes called 'barber's itch,' although that term is more appropriate to ringworm conveyed by the razor. Sycosis of bacterial origin can, of course, be transmitted in the same way. In most cases, however, there appears to be some special vulnerability of tissue on the part of the individual attacked; otherwise, considering the wellnigh universal distribution of the micro-organisms concerned, the disease would be as common as it is now fortunately rare.

DIAGNOSIS.—Sycosis may be confused with ringworm (*tinea barbæ*), eczema, impetigo contagiosa.

Ringworm of the beard (the old parasitic sycosis) is of slow onset, and is marked by the presence of deep, hard, scattered nodules. The hairs are loosened early in the disease, while they become dry, brittle, and lustreless, and can be painlessly extracted. Pustules are common, but the hairs do not, as a rule, pierce the papules and pustules. Under the microscope, hairs soaked in liquor potassæ will show ringworm spores, most commonly of the large-spored variety.

Eczema differs from sycosis in that the process in eczema begins in the skin, whereas in sycosis the hair-follicles are primarily affected. The affected area often extends beyond the hairy parts, and presents a weeping and crusted surface; pustules, when present, are superficial, and found chiefly at the margin. The hairs cannot be extracted at any stage of the process without pain. At the same time, it should be borne in mind that eczematous inflammation may complicate a true sycosis.

PROGNOSIS.—Sycosis can be cured eventually even in the most chronic cases, but relapses are common, and great patience has often to be exercised both on the part

of the patient and of the medical attendant. It often proves one of the most obstinate of all eruptions.

TREATMENT—General.—Constipation, anæmia, dyspepsia, and other obvious disorders, should be carefully attended to. Cod-liver oil and various iron preparations are sometimes useful. Calcium sulphide freshly prepared may be given in the form of pills. Three or four grains daily appear at times to control suppuration.

Local.—Authorities are divided upon the question of shaving, but on the whole the balance of opinion is in favour of a shave either daily or every other day. A good sulphur soap should be used; the razor, which must be sharp, should be immediately disinfected in boiling water. Any crusts or scales may be previously removed, if necessary, by soaking in oil and poulticing. All hairs in pustules should be systematically extracted every day, but it is probably better to wait until the hair is loosened by the suppurative process before attempting to epilate.

Mild antiseptic remedies, such as salicylic acid (10 grains to 1 drachm vaseline), carbolic acid, white precipitate, oleate of mercury (4 per cent. strength), may be applied thickly several times daily. It is often useful to combine some soothing remedy, such as calamine, oxide of zinc, or bismuth. In later stages the diluted nitrate of mercury ointment, or a sulphur ointment (15 grains to 1 drachm), may be useful.

Dr. W. H. Whitehouse, New York, recommends the following in the chronic stage :

R Olei cadini	...	...	℥ii.
Hydrargyri oxidi rubri	...	...	grs. xxiii.
Hydrargyri ammoniati	...	...	℥i.ss.
Sulphuris sublimati	...	...	℥ii.
Lanolini	...	...	℥ii.
Misce; fiat unguentum.			

Exposure to the X rays is sometimes attended with brilliant results, but the treatment is hazardous except in the hands of a properly-qualified medical expert. Cases of severe scarring and permanent damage have resulted from the attempts of non-medical operators.

The tendency to recur should always be borne in mind, and the patient should not be allowed to grow a beard until at least a year has elapsed since the disappearance of all signs of the trouble.

Lupoid Sycosis.—This name was given by Milton many years ago to a folliculitis of the beard region, which spreads at the periphery by a narrow erythematous margin, leaving behind scarring and destruction of the hair-follicles. Pustules appear in the invading edge. The disease is extremely chronic and rebellious to treatment. It is apt to recur in fresh places after the original eruption has ceased. Unna has described the condition under the name of 'ulerythema sycosiforme.'

Tinea Tarsi.—This affection, often known as 'blight,' is really an eczema of the edges of the lids, which are reddened and often stuck together, especially in the mornings, by a thin sero-purulent fluid. Minute crusts are often formed about the roots of the eyelashes. The disease is a kind of bacterial or coccogenic sycosis. In chronic cases the lashes become bent and twisted in various directions, and give rise to great irritation of the conjunctiva. Treatment consists in removal of crusts, the application of mild mercurial ointments and epilation of misdirected lashes. In chronic cases it is often useful to paint the edges of the lids with a weak solution of nitrate of silver (2 grains to the ounce) every few days,

III. Animal Parasites.

Of the animal parasites two varieties have to be considered—namely, the louse that attacks the head and that which lives usually in the pubic regions, but occasionally wanders to the hair of the axilla or the eyebrows and eyelashes. These parasites are found chiefly among poor and uncleanly people, but they may invade any class of society. They are always imported from outside sources by combs and brushes and in other ways, although popular fable often attributes their appearance to spontaneous growth. They are in themselves harmless, but give rise to considerable irritation, which leads to scratching of the scalp and other affected parts. The little wounds thus caused become infected with micro-organisms, and pustules or diffuse eczema may follow, with swelling of the neighbouring lymphatic glands, especially behind the ear and in the nape of the neck. The infectious inflammations thus set up may spread in the shape of eczema to the ears and neck, or the face may become affected with impetigo contagiosa, a form of pustular eczema, due to micrococcal invasion, and characterized by honey-yellow and greenish crusts that appear to be stuck loosely on a reddish base.

Pediculus Capitis.—The head-louse is a whitish-grey insect, about $\frac{1}{16}$ inch long and about half as wide; it has six legs, armed with hooklets, with which it clings to the hairs. The females are larger than the males, and lay a great number of eggs. The latter, or 'nits,' are attached to the hairs by a peculiar gummy substance. A nit may be made to slide up and down a hair by grasping it firmly between a finger and thumb of one hand, while the hair is fixed with the other hand. It is advisable not to communicate any suspicion as to the presence of

pediculi in a patient's head unless ocular proof of the statement is forthcoming. When only one or two nits can be seen in the head, it is often impossible to discover any pediculi.

The favourite situation of the pediculi is at the back of the head, and scattered, scratched, or scabbed patches in that position should always suggest the presence of the parasites. In neglected cases they may spread to the whole of the scalp. Sometimes they are present in enormous numbers, and the hair becomes matted into a felted mass, known as *Plica Polonica*—a name derived from its frequency in Poland. It is rare in the United Kingdom, and the present writer has met with only two instances among a large number of hospital patients.

TREATMENT.—The main principle of treatment is to destroy the parasites and their eggs, when the associated inflammations and swellings, as a rule, will disappear rapidly. Now and then, however, an eczema lighted up in a susceptible patient may survive a chronic form.

Children are specially apt to be infected with pediculi, probably from the use of infected brushes and from exposure at school. With this as with other remedies it must be borne in mind that fresh ova hatch out later and start the trouble anew. The use of the medicament must therefore be kept up for some time, and special measures taken to rid the hair of nits by the use of a fine tooth-comb. In children the hair may be cut short. Carbolic acid is a useful application, and may be applied as an ointment either alone or combined with ammoniated mercury.

As already hinted, this troublesome pest may be met with at times in any class of society. By bearing that fact in mind the medical practitioner will now and then find the clue to an otherwise perplexing condition of the

scalp and neighbouring skin-surface. Another useful fact is that aged persons are apt to become invaded, and, for some reason or other, it is then often extremely difficult to cure the condition, and hardly less so to prevent its recurrence.

Corrosive sublimate is a powerful parasiticide, but must be used with caution when there is a raw surface. It should not enter into any preparation entrusted to a patient even in weak solutions. An efficient application is soaking the head for a couple of nights in ordinary lamp paraffin. It is a dangerous remedy, however, owing to its inflammable nature, and several fatal accidents have followed its use. On the whole, it will be wiser to trust to ordinary parasiticide remedies. Formalin forms an excellent and effectual application.

Pediculus Pubis.—This insect is much shorter and broader than the head-louse. It inhabits the pubic region, but, as already pointed out, it occasionally spreads to the axilla, eyebrows and eyelashes, and even the beard, but is never found on the head. The nits are very small and of a grey colour. In the eyebrows and eyelashes the pediculi may give rise to inflammatory trouble. They may be destroyed by rubbing in mercurial ointments.

BRITTLENESS OF HAIR

Fragilitas Crinium.—Brittleness of hair is a symptom that marks many or most conditions of disturbed nutrition. They may be toxic, as in fevers, or nervous, or due to local invasion as by fungi or bacteria, or to other less clearly defined causes. The nutrition of the hair appears to depend on fluids carried along and between the cells of the cortex and medulla. The nutrient plasma

is conveyed either through the bulb or the cells lining the hair-follicle. The sudden arrest of the capillary supply to the follicle may deprive the hair of its intracellular substance, and lead to brittleness, loss of lustre and whiteness, the latter owing to the occurrence of air-spaces. Whether this be the correct explanation or not of the pathological conditions alluded to, it seems certain, for reasons mentioned elsewhere, that the well-being of the hair is closely dependent on general and local health. The split ends of hairs, more common in women, may often be due to simple failure of nutrition or to mechanical causes apart from invasion by bacteria or fungus.

Fragilitas crinium is the name first applied by Sir Erasmus Wilson to the condition now known as *trichorrhexis nodosa*.

GREYNESS AND WHITENESS OF HAIR—CANITIES

The method of production of pigment in hair and its exact anatomical disposition are in dispute. Greyness or whiteness of hair is due to two causes—first, absence or diminution of pigment; and, secondly, the presence of air-spaces in the substance of the hair. When due to absence of pigment, the hair has a slight yellowish tint; when due to the presence of air, it assumes a steel-grey or snow-white appearance. Canities may be—(a) congenital, (b) acquired.

(a) **Congenital Canities.**—White hair occurs in albinos, in whom there is also an absence of pigment in the rest of the skin and the iris and the choroid lining of the eyeball. In rabbits the albino has white hair, pink eyes, and associated deafness.

The more common form of congenital whiteness of

hair is a tuft of white hair. This tends to run through a family; who may all have the parti-coloured patch in the same place, although the parents show nothing of the kind. The white patch, when developed, may be handed on for several generations.

(b) **Acquired Canities.**—So many well-authenticated instances of sudden blanching of the hair, through fright or other strong emotion, have been put on record that the truth of the occurrence cannot be disputed. This change must be due to nervous influences, and may be compared with the blanching that sometimes follows neuralgia.

1. *Premature Canities.*—Early whiteness runs in some families. According to some observers, it is more or less due to seborrhœic processes, which are hereditary because they are communicable. Certainly scattered grey hairs are common in seborrhœa.

2. *Senile Canities.*—Greyiness in old age is a natural occurrence. The loss of colour is due to pigment atrophy and to the development of air-spaces in the shaft of the hairs. In spite of blanching, the growth of the hair may continue vigorously. Grey hair is in nine cases out of ten comely to its owner, who, nevertheless, often thwarts the beautifying hand of Nature by the use of dyes that ruin the hair and give a hard look to the features.

3. *Accidental or Fugitive Greyness.*—The best example of this form of blanching may be seen in the hair growing on a patch of alopecia areata. At first this hair is usually white, but later assumes its right colour. In patients over fifty years of age it may remain permanently white. In one striking case, in a young man whose head was entirely bald, the scalp had become covered with a growth of coarse white hairs an inch long; the lower

end of the hairs grew dark, and eventually the whole hair shared the pigmentary change.

In rare instances white hair may regain its colour, especially when the whiteness has followed some severe illness or other definite cause. The fleeting change of colour in some illnesses, as neuralgia and influenza, has been already alluded to, as well as the occurrence of white patches along with the bald patches of alopecia areata, and the white patches occasionally met with in patients suffering from exophthalmia, goitre, or myxoedema, or in persons having a congenital high forehead.

PROGNOSIS.—In congenital and senile canities there is practically no chance of restoring the colour of the hair. In alopecia patches the pigment usually returns, especially in persons under middle age, in response to prolonged stimulation, and, above all things, appropriate electrical treatment.

TREATMENT.—The only thing that can be done in congenital and old-age whiteness is to dye the hair. The desirability of that step must be determined by the patient, but the physician should be alive to the danger of many of the remedies used for hair-dyes, such as nitrate of silver and lead salts. Attention to the general health and cure of local inflammatory conditions may help matters, the latter especially in old-standing neuralgic and tender scalps. Gentle electrical stimulation is sometimes of service, but must be persevered in for some time to be of any real benefit.

The present writer has repeatedly noted that under treatment pigment has returned to the scattered white hairs and to the grey patches seen above the ears in seborrhœa, especially when reducing agents are used.

When greyness or whiteness has followed an acute illness in patients below middle age, it is always well to

ascertain the exact condition of the scalp, as the colour should in such cases return under appropriate treatment.

Ringed Hair.—In this rare condition the hair can be seen by the naked eye to have a banded appearance. The shaft is not alternately swollen and contracted as in the moniliform hair, although the white part is sometimes larger than the darker or normal space. The pigment runs right through the medulla of the ringed hair, but is obscured at the white rings by a multitude of air-vesicles. The abnormality may affect the whole head or only a tuft of hairs. It is not hereditary, and was first described by Erasmus Wilson and Karsch. Unna has noted it in connexion with white spots on the nails, an appearance also due to the presence of air in the horny epithelial structures.

NODULAR NON-PARASITIC DISEASES OF HAIR

Monilethrix.—The beaded appearance of the hair in this condition led to the above name, given to it by Crocker. In it the hair-shaft is narrowed at intervals, which are usually, though not always, regular. It affects the hair not only of the head, but also of the body, and may be found only in one part of the scalp. There is much more pigment at the nodes than in the internodal constrictions: its hair is brittle, and breaks off easily at the internode. This disease runs in families, and appears at or soon after birth. There is no evidence that it is connected with any special infection, although constantly connected with keratosis pilaris—a condition in which there is a heaping up of epithelium at the point of emergence of the hair from the skin. In typical cases of monilethrix the hair is short and scanty.

Moniliform Hairs.—The present writer has met with some cases of moniliform hair that differ from monilethrix in essential particulars.

He found five hospital cases in which moniliform hairs were associated with patches of alopecia areata and partial greyness of hair. The patients were women whose ages varied from thirty-nine to fifty-one years. The pigment

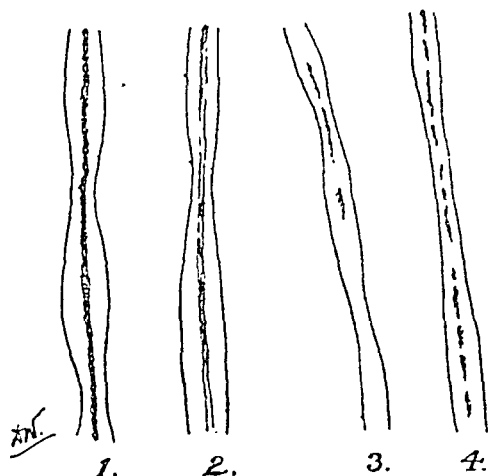


FIG. 4.—MONILIFORM HAIRS FROM FOUR PATIENTS.

had no distinct distribution in relation either to nodes or anodes, and the condition appeared to be connected with alopecia and seborrhœa. It is possible that the traction due to dressing the head may have altered the shape of the hair-shafts, the nutrition of which from some cause had become disturbed. A full account of these cases has been published elsewhere.*

* *British Medical Journal*, 1902.

THE NODULAR PARASITIC DISEASES OF THE HAIR

A group of diseases characterized by nodular swellings of the hair, due to parasitic invasion, includes the following:

1. Piedra.
2. Lepothrix.
3. Trichorrhexis nodosa.
4. Hodara's disease.
5. Giovannini's disease.

1. **Piedra.**—This affection was first described in 1876 by Dr. Osorio, of Bogota. The hair-shaft is covered at irregular intervals with nodules, which are formed by growths of an epiphytic fungus. The nodules are extremely hard, hence the name 'piedra' (a stone), and can be felt on drawing an affected hair through the fingers. They are due to a peculiar fungus which does not penetrate the shaft, but encircles it with masses of scanty mycelium and abundant oval spores. The fungus is found chiefly in the United States of Columbia, where it is confined to the female sex; and is fostered by the peculiar method in vogue of dressing the hair with linseed-water. This mucilaginous application appears to be favourable to its growth. Piedra occurs in other countries, and is contagious. Treatment consists in the free application of soap and of active parasiticides.

2. **Lepothrix.**—The name means 'scaly hairs,' and was given to the disease by the late Sir Erasmus Wilson. In this affection the hairs lose their lustre, and on close inspection are seen to be more or less unevenly coated with a yellowish material that cannot be scraped off with the nail. It is extremely common, and affects probably

one out of every three or four persons. It is harmless, and causes no irritation or annoyance. The cause is a microparasite, apparently a small bacillus, which burrows into the hair on the one hand, while on the other it throws off the yellowish stuff that forms the crust outside the shaft. This organism can flourish only under certain conditions, which appear to be furnished in the armpit and pubic region, to which it is confined. The red staining of under-clothing beneath the armpit is due to this cause.

Treatment consists in plentiful washing and strong parasiticide lotions.

3. **Trichorrhesis Nodosa.**—Although this disease has been included among the nodular parasitic affections of the hair no micro-organism has yet been identified as its cause. Perhaps the safer view would be to regard it as a condition in which the nodular swelling and feathery fracture of the hair may be due to various causes.

The disease is usually met with in the beard and moustache, although it may occur in the eyebrows, head, or any other part of the body. At first sight the hair looks as if it had been singed, but a closer inspection shows that the ends of the hairs are frayed, and their shafts dotted irregularly with greyish-white nodules. An affected hair can readily be broken off at one of these little swellings. Under the microscope the broken ends of the hair present a characteristic appearance. They

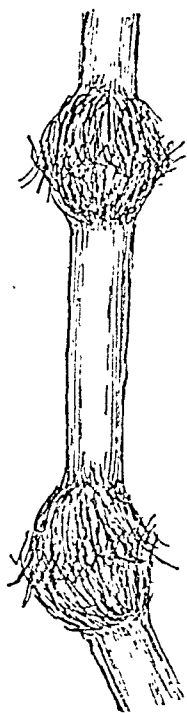


FIG. 5. — HAIR IN TRICHORRHEXIS NODOSA, SHOWING NODULAR SWELLINGS.

have been aptly compared to a brush, and are called by the Germans 'broom hairs.' A still better description is that given by Dr. D. W. Montgomery, when he says the fracture has 'the fibrillated appearance that a green branch gets when frequently bent at one point.'* The nodules are sometimes mistaken for nits, as happens now and then with lepothrix, but the point can be at once settled by examination of an affected hair under the microscope. The author has met with one case of this rare affection in a hospital patient, an unmarried woman of middle age.

Laissueur supports Sabouraud's theory that the cause of trichorrhexis is mechanical. Experimentally it was produced in four cases in the hair of the moustache by the free use of soap. The condition was found in only one out of fifty-six patients, but it was present in the bristles of the shaving-brush of every one of them.

Treatment consists in cutting short or shaving the affected area and the use of stimulant antiparasiticide applications. Attention to the state of the general health may be required.

4. **Hodara's Disease.**—This appears to be a form of trichorrhexis nodosa in which a fungus has been identified. It is common among the women of Constantinople, where it was first described by Menahem Hodara. It is an infective disease of the hair of the head apparently peculiar to women. The affected hairs split at the ends and break off at one of the long greyish nodules, of which a few are to be found on close examination of the affected hair. Hodara found a small bacillus with rounded ends constantly present. Cultures of this microbe reproduced the disease in the hair of a girl. Dr. Montgomery ('Twentieth Century of Medicine')

* 'Twentieth Century Practice of Medicine,' vol. v., p. 610.

sums up the differences of Hodara's disease from ordinary trichorrhæxis nodosa, as known in Europe and America, thus :

'(1) In the nodules being much smaller. (2) In all the nodules being situated towards the tip of the hair. (3) In its occurring most frequently in women, up to the present no instance having been observed in man. (4) In being observed only in the hair of the head. (5) In being accompanied by splitting of the hair.'

5. **Giovannini's Disease.**—A curious case has been described by Sebastian Giovannini, of Bologna, who found a nodular condition of one half of the moustache of a patient. Microscopically, the hair was seen to be surrounded with a growth composed of mycelium and spores, but not corresponding to any ordinary disease-producing fungi, as that of ringworm, favus, or pityriasis versicolour. Giovannini himself thought that probably one of the non-pathogenic fungi of food had for some reason or other become lodged in the particular position where it was found.

Nævus.

Nævus is common on the scalp, and usually appears shortly after birth. It varies from a flat nævus, in which there is a superficial network of dilated capillaries, to the 'port-wine mark' of the ordinary vascular nævus, in which there is a network of large dilated bloodvessels, together with more or less hypertrophy of neighbouring tissues; or it may be of the cavernous kind, in which there are large blood-spaces communicating with arteries and veins, pulsating and steadily invading surrounding parts.

Nævi of all kinds are common on the scalp and face. They may be present at birth, but more often make

their appearance a few weeks later. It is only in rare cases that they disappear spontaneously. The best treatment for the less severe forms is by electrolysis, performed, if possible, within the first few months of life. When destroyed on the scalp, a bald area is left. In the cavernous forms electrolysis up to 20 milliampères of current strength is needed, and requires an anæsthetic, which, indeed, is desirable in all cases. The most severe forms of cavernous angioma, especially if near the orbit or other important structure, demand early surgical excision, as the growth may steadily invade bone and other structures, and even become fatal. In cases where a hypertrophic scar results this may often be flattened by the application of the X rays. After an extensive experience of all methods of treatment of nævus, the author recommends electrolysis as far the best in the majority of cases, and failing that, early and complete excision. As a rule, port-wine marks, no matter how extensive, can be dealt with most satisfactorily by the electrolysis needle, while treatment by radium, sodium ethylate, Finsen light, X rays, and other methods is not only tedious and costly, but is also uncertain and disappointing in its results.

Nævus Pigmentosus.—Pigmented or hairy mole is really congenital, although it may not appear until some time after birth. The chief features of the hairy mole are its light and dark brown pigmentation, its thickening of skin and subcutaneous tissue, and, as a rule, a growth of hairs, tending to become thick and coarse. The pigmented mole may appear on any part of the skin-surface. It is usually small, from the size of a split pea to half a crown, but may sometimes be as large as the palm of the hand, and on the body and limbs it may cover large areas. Sometimes the hairs project from a dark warty surface.

Treatment.—The only treatment that can be sanctioned is the removal or destruction of the growth. In trifling cases this may be done by electrolysis, especially if performed early in life. Electrolysis is too tedious to apply to extensive moles, which must be treated either surgically or by the X rays. Excellent results are obtainable by a combination of the two plans. The medical attendant should always insist upon an exhaustive trial of these methods, in view of the well-known tendency of pigmented moles, especially if irritated by clothing and in other ways, to develop into extremely malignant growths (melanotic cancer) in later life.

Apart from that danger, the disfigurement of hairy moles and of nævi is often most distressing to their owners. Indeed, there is hardly anything more satisfactory to every one concerned in the whole range of minor surgery than the successful removal of these blemishes. At the same time the procedure, simple though it may seem, is safe only in the hands of a properly trained medical man. Otherwise nerves may be destroyed, while wounds may become septic and end in disfiguring scars and certain injury to health.

DISEASES OF THE NAILS

NAILS, like hair, being modifications of the epidermis, are subject to various disturbances of nutrition, which, as a rule, follow affections of the surrounding tissues. Their structure is hard and resistant, so that almost their only primary malady is caused by the invasion of the ringworm fungus. At the same time, they are readily affected by neighbouring disturbances; for instance, some nerve troubles are followed by atrophy or deformity or loss of nails. Diseased or altered conditions of the nails often suggest the need of a careful investigation of the general health. The nails often afford evidence of serious constitutional affections, such as lung or heart disease, gout, syphilis, and tuberculosis.

Hypertrophies.

Onychiauxis is an overgrowth of the matrix of the nail. It may be congenital, or may follow ichthyosis. It may follow inflammations of the matrix, whether acute or chronic. One form is the 'Hippocratic nail,' which is thick and rounded, and usually goes with club-ended fingers, due to chronic pulmonary or cardiac disease.

Onychogryphosis (*gryphosis* = claw) is a twisted, thick and elongated condition of the nail, which is grooved,

ridged, and discoloured somewhat in the fashion of a ram's horn. The great toe is commonly affected, but sometimes all the toes; but the fingers are rarely involved.

Ingrowing Toe-nail is a very painful affection, in which the nail—usually as the result of injury or pressure (tight boots)—invades the neighbouring tissues. A discharging surface, with exquisitely tender granulations, forms at one or both upper angles of the nail.

Psoriasis of the nails may affect fingers or toes, and one or all the nails may be attacked, usually on both sides. There is a patch of discoloration, which may extend from the full edge to the base of the nail, while the nail may be fitted or raised by an overgrowth of nail-bed, sometimes to $\frac{1}{4}$ inch in thickness. There may or may not be psoriasis of the skin-surface elsewhere.

Atrophies.

There is sometimes congenital brittleness, or thinning, or absence of nails, often associated with defects of hair and teeth.

Thinning of the nail-plate may occur simply, or more often with transverse furrows, or sometimes with a concave surface or 'spoon nail.' The condition may be hereditary. In another form the nail curves upwards, and where it leaves the nail-bed has a whitish-blue colour, like the inner lining of a hen's egg, whence it has been called by Hyde 'egg-shell nail.' **Ridging of the nails** is often associated with gout; sometimes a central ridge is formed, and then splits down the centre.

Shedding of the nails follows many acute inflammations, and some of the fevers, especially scarlatina. They may also be shed as the result of affections of the spinal cord, or of the peripheral nerves. The latter are probably involved in the shedding and extreme deformity that

sometimes follow prolonged exposure to the Röntgen rays.

Eczema leads to atrophic changes of the nails, such as dotting, discoloration, and transverse furrows.

Parasitic Diseases.

The fungus of ringworm and of favus may attack the nails at any age. The nails are much deformed, being grooved, ridged, discoloured, and their smooth surface, especially at the lower ends, replaced by a stippled yellowish, ridgy, and irregular growth. Scrapings of the nail steeped in liquor potassæ and placed under the microscope reveal the presence of the fungus. The disease may exist for very many years.

Anatomical.

Pterygium is the name given to the fold of membrane at the base of the nail when, instead of forming a neat sharply defined ridge, it extends diffusely down the nail, to which it adheres closely.

Warts are of some importance when they grow at the base, or sides, or under the free edges of the nail. They are apt to cause much pain and annoyance, and to become unsightly. They are usually associated with warts elsewhere, and are often of the seborrhœic variety, associated with dandruff and other affections of the scalp.

Pigmentary Changes.

Leuconychia, or whitening of the nails may occur in, spots or stripes, or sometimes affect the whole nail. The cause is obscure, but it is sometimes connected with nerve troubles. In jaundice the nails may have a yellowish tinge.

TREATMENT.

There are certain general principles in the treatment of the nails. Scraping with a knife or a piece of glass is often of great service in relieving tension or permitting the close application of remedies. Owing to the structure and position of the nails, they are prone to bacterial infection, so that antiseptics have a prominent place in treatment.

In onychogryphosis it is necessary to cut away the thickened nail with a strong pliers, and to treat the base with salicylic acid.

Ingrowing toe-nail must be treated energetically. The best plan is to rub the granulations with solid lunar caustic. The pain of this proceeding can be avoided by the use of eucaine. The small pieces of sponge or of lint are then pressed down between the edge of the nail and the granulations, and the toe kept in a moist antiseptic dressing. The process may have to be repeated several times, and the lint finally introduced underneath the nail. In severe cases it may be necessary to remove the nail.

The successful treatment of ringworm of the nails depends on scraping away repeatedly as much of the surface as possible, and the prolonged and careful application of antiparasitic drugs.

Lastly, it should be noted that sometimes a deformity of a nail may be remedied by a simple plastic operation.

The treatment of warts is to destroy with caustics, three or four applications usually being enough, although in rare cases more may be needed. The most scrupulous care must be taken in the protection of neighbouring tissues, or great pain and more or less deformity may result.

INDEX

- Ainos, hairy, of Japan, 4
- Alopecia areata, 40
 - " " causation of, 41
 - " " treatment, 46
- Anæmia, cause of baldness, 15
- Anatomy of hair, 8
- Assyria, dressing hair in, 1
- Atrophy of hair, 32
- Baldness, exciting causes of, 40
 - " in bands, 40
 - " its infectivity, 18
 - " main causes of, 15, 32
 - " patchy, 40
 - " " and thyroid gland, 43
 - " " treatment by electricity, 46
 - " predisposing causes of, 35
 - " preventable, 6
- Barber's pole, 2
 - " shop, hygiene of, 22
 - " " suggestions as to conduct of, 25
- Barbers, the craft of, 2
- Bearded type, feminine reversion to, 4
- Bed, hair, 11
- Blackheads, 13
- 'Blight' of eyelids, 73
- Brittleness of hair, 76
- Brush and comb, 19
 - " single bristle, 65
 - " to disinfect, 20
- Canities, 77
 - " congenital, 77
 - " premature, 77
 - " senile, 77
- Chinese women, the hair of, 33
- Colour of hair, 8
- Comb and brush, 21
- Comedones, 73
- Cortex of hair, 9
- Dandruff, 17
- Darwinian theory of hair development, 3
- Depilatories, 29
- Direction of hair, 5
- Diseases of hair, 27
- Eczema of scalp, 68
- Electrolysis of hairs, 30
 - " of nævus, 86
- Environment baldness, 37
- Epilation, 30
- Favus, 58
- Feminine reversion to bearded type, 4
- Fœtus, development of hair on, 11

- Fragilitas crinium, 76
 Fungus of favus, 58
 „ of ringworm, 49
 „ „ to stain, 55
 Giovannini's disease, 85
 Gout in baldness, 37
 Greyness of hair, 77
 „ premature, 77
 „ senile, 77
 „ sign of atrophy, 16
 Hair-shaft, 8
 Hairy men, 4
 Hirsuties, 27
 Hodara's disease, 84
 Honeycomb ringworm, 58
 Hygiene of hair, 14
 Hypertrichosis, 28
 Hypertrophies of hair, 27
 Infant, hairy covering of, 3
 Infectivity in baldness, 18
 Ingrowing toe-nail, treatment of, 89
 Japan, hairy race in, 4
 Lanugo, infantile, 3
 „ adult, 5
 Lepothrix, 82
 Leuconychia, 91
 Lotion, application of, 67
 „ detergent, 67
 Lupoid syphilis, 72
 Mammalia, hair of, 2
 Medical, necessity of, knowledge, 6
 Medulla, 9
 Microscopical sections of hair, 1, 9, 11, 13
 Monilethrix, 80
 Moniliform hairs, 81
 Mummies, hair of Egyptian, 6
 Mycoses, or fungi, 48
 Nævus of scalp, 85
 „ electrolysis of, 86
 „ pigmentosus, 86
 Nails, diseases of, 88
 „ eczema of, 91
 „ ringworm of, 91
 „ shedding of, 89
 Negroes, baldness in, 37
 Nodular non-parasitic diseases, 80
 „ parasitic diseases, 82
 Oily applications undesirable, 17
 Onychogryphosis of nails, 88
 Overgrowth of hair, 28
 Papilla of hair, 8
 Parasites, animal, of scalp, 75
 Patchy baldness, 40
 Pediculi of head, 75
 Persistence of hair, 6
 Piedra, 82
 Pigment, 8
 Pigmented nævus, 86
 Pith of hair, 9
 Pityriasis of scalp, 63
 Pole, barber's, 2
 Port-wine marks, 86
 Powder puffs, 24
 Proprietary hair lotions, evil of, 34
 Psoriasis of scalp, 69
 Razor, first mention of, 2
 „ infected at barber's, 23
 Rheumatism and baldness, 37
 Ringed hairs, 80
 Ringworm in schools, 26
 „ fungus, 49
 „ varieties of, 50, 52
 „ fungus, to stain, 54
 School Boards and ringworm, 26
 Schools, hygiene of hair in, 26
 Sebaceous follicle, 12
 Seborrhœa, its origin in acute illness, 15
 „ of scalp, 61
 Senile baldness, 36
 Sex and baldness, 36
 Shaft of hair, 8
 Shaving-brush infected, 23
 Shaving off superfluous hairs, 30
 Shedding of hair, 32

Shedding of hair, diseased, 32	Tinea, large-spored, 50
" " natural, 11	" small-spored, 50
Soap, detergent, hair, 16	" tarsi, 73
Superfluous hairs, 28	" varieties of, 50
" " treatment of,	Toe-nail, ingrowing, 89
29	Trichorrhæxis nodosa, 83
Sycosis, lupoid, 73	
" or barber's itch, 23, 69	Warts, seborrhœic, of scalp, 64
Tactile function of hair, 5	Whiteness of hair, 77
Thyroid gland and nutrition of	
hair, 36	X rays in treatment of ring-
	worm, etc., 26, 30, 52

THE END

